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THE CANADIAN

ENTOMOLOGIST.

VOLUME I.

EDITED BY

THE REV. C. J. S. BETHUNE, M.A.,

SECRETARY TO THE ENTOMOLOGICAL SOCIETY OF CANADA.

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ERRATA.

Page 19, 7th line from bottom, for *Aretia*, read *Arctia*.
" 6th " " *Coleopetra*, read *Coleoptera*.
" 45, 10th " top *constantly*, read *constant*.
" 87, 16th " " *Phesia*, read *Plusia*.
" 92, 2nd " " *tæta*, read *læta*.
" 3rd " " *Acadia*, read *Acadica*.

For other Errata, see page 84. Pages 44 to 50 are numbered improperly; they should be 46 to 52, respectively.

The Canadian Entomologist.

Vol. I. TORONTO, AUGUST 1, 1868. No. 1.

INTRODUCTORY.

For a long time, the wielders of the Butterfly net and Beetle bottle in Canada have been longing for some medium of intercommunication—some mode of telling one another what they have taken, how and where they have taken it, and what they are in want of. This desire the Entomological Society purpose now to satisfy to some extent by the publication of the *Canadian Entomologist*. It is but a few years since the Society itself began as a little germ with a few members, and now we find it rapidly growing into a goodly tree with its main trunk in Toronto, its thriving branches in London and Quebec, and its scattered adherents all over the country. We trust that the success of this publication may be somewhat similar; it begins now with a few pages, a limited circulation, and a very small supply of the necessary funds, but we hope and believe, too confidently, perhaps, it may be—that it will by and by grow and increase, and acquire goodly dimensions, and become a handsome and valuable exponent of the progress of Entomological Science in this Dominion. May we beg, then, that all zealous Entomologists around us will come forward and assist the enterprise with at any rate their pens, if not always with their purses too.

And now for a word as to the proposed character and contents of the work. The *Canadian Entomologist* is intended to contain original papers on the classification, description, habits, and general history of Insects; the transactions of the Entomological Society of Canada; short notices of new works on Entomology; accounts of the capture of new or rare species in Canada; lists of specimens for exchange, and *desiderata*, by members; correspondence, answers to correspondents; notices to members, and suitable advertisements. It will be published not oftener than once a month, and only when there is a sufficiency of suitable matter for publication; its terms are gratis to members of the Society; 50 cents per volume of 12 numbers to non-members; extra copies will be sold at the rate of five cents each, or fifty cents per dozen. Any contributions to the publication fund will be thankfully received and gratefully acknowledged.

All communications and remittances should be addressed to the Secretary-Treasurer of the Entomological Society of Canada—"THE REV. C. J. S. BETHUNE, CREDIT, ONTARIO, CANADA."

A LUMINOUS LARVA.

BY THE REV. C. J. S. BETHUNE, M.A.

On the 5th of July, a friend brought me a very remarkable Larva that he found in a field the previous evening, and which had attracted his attention by the light it emitted. When alive it was about an inch and a half in length, and 0.25 inch in width across the middle, its general appearance being long and narrow; it is flattened above, and composed of twelve segments (exclusive of the head); each segment is broad and cut squarely, and overlaps the following one, the posterior angles being a little acute; the anterior segment is gradually narrowed in front and rectilineally truncate, forming a shield to the head which is retractile within it; each of the first three segments has a pair of claw-like legs attached to it beneath. The general colour of the insect is a dark drab, the posterior angles of each segment, the softer connecting portion between the segments, and the under side of the body being very much paler, and of a somewhat dirty yellow hue; on each side there is a deeply impressed line in which the spiracles are situated. When seen in the dark the insect presented a very beautiful appearance, being apparently ringed and dotted with greenish fire. Each spiracle appeared to be a point of bright greenish light, and the division between each segment a line of the same colour; it looked, indeed, as if the whole insect were filled with fire, which shone out wherever it was not concealed by the dark shelly integument. When coiled up on its side it looked like a lovely Ammonite whose striæ emitted a green light, and with a point of green fire in each interspace.

The morning after receiving the insect, I left home in order to attend the Annual Meeting of the Entomological Society at London, where the specimen attracted much attention; unfortunately I was unable to find out its proper food (which I now fancy must have been snails and slugs), and when I reached home, ten days afterwards, the worm, to my great regret, was dead, and I have failed in rearing it. On comparing, however, Westwood's description and figure of the larva of the English Glow-worm (*Lampyris noctiluca*), I cannot but think that my specimen is a closely allied species, and belongs at any rate to the family Lampyridæ. At the London Meeting it was mentioned that a similar luminous larva had been captured in that neighborhood some years ago, but that nothing had been determined respecting it.

The chief point of interest in this case is the luminosity of a *Larva*. Everyone in this country is well acquainted with the light-giving powers of our common winged "Fire-flies," and most of us have seen specimens of the female apterous "Glow-worm" found in England; but that a larva should possess this singular property is a novelty to us all. On looking up various authorities I find that Westwood mentions that the males, pupæ, larvæ, and even the eggs of the English Glow-worm are slightly luminous; and Kirby and Spence refer to a few similar instances. The last mentioned authors (Letter xxv.) also give an account of the various theories respecting the origin of this light, to which we would refer our readers. Professor Croft, who examined my specimen at London, has since written to me as follows:—"Burmeister found the larva of *Lampyris splendidula* phosporescent—he does not say how. Treviranus seems to have found that the light-giving substance (whatever it is) is diffused throughout the whole body of the insect, and that the appearance of the light in the thorax of *Elater noctilucus*, and in the abdomen of the different species of *Lampyris* is due to *these special portions* being composed of a fatty matter which allows the light to pass through. It is generally believed that the light-giving substance is phosphorus or some compound thereof, the light being caused by the air supplied by the breathing apparatus. Now, if we allow this to be true, *i.e.*, that the whole of the body of the insect becomes luminous under peculiar conditions, then, as your larva was composed of dark brown segments separated by lighter partitions, which apparently expanded as the heart moved, we can account for the very beautiful appearance it exhibited—the light shining through the paler or fatty-covered portions. It may perhaps be the larva of a *Lampyris*."

Should any of our readers have met with similar larvæ, or be able to afford us any information on this interesting subject, we shall be very glad indeed to hear from them.

ENTOMOLOGICAL NOTES.

PAPER No. 1.

BY W. SAUNDERS, LONDON, ONTARIO.

On the morning of the 12th May, while rambling about on the edge of a wood near London, I happened to observe some chips from a newly felled tree strewing the ground. While turning them over in search of insects, the sight of an object I had never seen before excited my curiosity. It was the full grown larva of a butterfly—a *Polyommatus* or *Thecla*—I was not sure which. It had just stretched a silken thread across its body to aid in securing it to the spot selected in which to pass the crysalis

stage of its existence. As soon as possible, with the help of a magnifying glass, I took the following description :—

Length, 0.45 in., greatest width, 0.20 in.—onisciform.

Body, above, dull rosy red, with a diffused yellowish tint on the sides, most distinct along the middle segments, and a dorsal line of a deeper shade of red. Body downy, with minute yellowish and brownish hair, scarcely visible without a magnifier.

On the 16th of May it changed to a chrysalis, and on the 28th the following description was taken :—

Length, 0.40 in., greatest width, nearly 0.20 in.

Color, pale, dull brownish red, with many black dots; a ventral streak of brown, dotted with black, with two diverging branches on anterior portion of body; a band of the same color across the base of the head, and a short cross line about midway between these. On each side of the body are three rows of black dots, one dot on each segment in each of the rows, the two upper ones extending from the 6th to the 11th segment inclusive—the lower one the whole length of body. Below these are a few additional black dots, very minute. Body thickly covered with very brownish dots, and roughened with minute pale tubercles.

On the 3rd of June the chrysalis began to grow darker, and soon a reddish lustre shone through the thin membrane covering the wings; on the 5th the imago was produced, which proved to be *Polyommatus Americana*.

These observations seem to establish this point: that the insect passes the winter in the larva state, probably nearly full grown. The chrysalis period was no doubt prolonged in the present instance by being kept *in a cool room*.

Drasteria erecthea is one of our commonest moths—common almost everywhere. It is one of the earliest on the wing in spring, and specimens of the second brood may be found up to quite a late period in the autumn. It frequents open places on the grassy sides of railway tracks, in fields and meadows, suddenly starting up before you and, after a short but rapid flight, as suddenly alighting.

About the middle of August I captured a female specimen and confined it in a pill-box, where, a few days afterwards, I found it had deposited a number of eggs. These, in a short time, hatched, and from a number of different kinds of leaves, put in for the larva to feed on, they selected clover, on which they were easily reared. By the 21st of September they were full grown, in fact several specimens had already entered the chrysalis state. On that date the following description was taken :—

Length, 1.25 in. Body thickest along the middle segments, somewhat smaller towards head, but tapering much more towards posterior segments. Head medium sized, flattened in front, pale brown, with darker longitudinal lines.

Body, above, reddish brown, with many longitudinal lines and stripes of a somewhat darker shade. A double, whitish, dorsal line, with a stripe on each side of the darker shade of brown; another stripe of the same hue close to stigmata, and between these are faint longitudinal lines. Spaces between segments from fifth to eighth, nearly black above; this, however, is only seen when the body is coiled up, which the larva readily does when disturbed.

Under surface slightly darker than upper, with many longitudinal lines of a still deeper shade, and a central stripe of blackish green from 6th to 9th segments; feet and prolegs greenish, semi-transparent, with faint lines, and dots of a darker shade.

This larva has only three pairs of prolegs, and in its movements resembles the true Geometer's. Early the following spring the chrysalides produced the imago.

During the summer of 1866, late in July or early in August, a female specimen of that very rare moth, *Arctia parthenos*, was captured by Mr. B. Billings, of Ottawa. While confined in a box it deposited a number of eggs, which, a few days afterwards, produced the young larva. These fed readily on lettuce and other herbaceous plants, so that they were reared without difficulty until they were about half or two-thirds grown. The season was now advanced, and they refused to eat any more. At this period of their growth it appears they hybernate for the winter, hiding in crevices, and under loose pieces of bark on trees, &c., and finish their growth the following spring. For want of circumstances favorable to their preservation many of them shrivelled up and died. Several specimens were sent to me to see if I could winter them, and from one of these the following description was taken :—

Length, 1.25 in., cylindrical. Head medium sized, bilobed, black and shining, with a few brownish hairs. Body, above, black, with transverse rows of shining tubercles, rather large, and of a dull, brownish-white color, excepting a few on anterior segments, which are black. From each tubercle arises a tuft of brown hair. The hairs on anterior segments and around the base of body are rather short, the other long, silky, of a slightly paler shade of brown, and extending backwards, overhanging the segments behind them. Stigmata elongated, and of a yellowish orange color.

Under surface black, with a slight brownish tinge; 5th, 6th, 11th and 12th segments, with a transverse row of black tubercles in continuation of those above, each emitting several short, dark brown hairs. Feet black, banded with whitish brown; prolegs black without, tipped with greenish brown.

I was unfortunate with my specimens; Mr. Billings was equally so. Mine were buried in a box, under the ground, thinking this would preserve them in a uniform state of moisture. When taken up in the spring two of

them showed signs of life, but they soon dried up and died. By confining female specimens (especially such as are in a damaged condition) of our rarer moths in boxes eggs may often be obtained; and from these, with attention and care, the history of the species may be worked out.

NEW FLUID FOR PRESERVING LARVÆ, &c.

A cheap fluid for the satisfactory preservation of larvæ and other soft animal forms has long been a desideratum among naturalists. The following solutions, prepared by Professor Verrill, and published by him in *Silliman's Journal*, have been found satifactory for the preservation of both the color and form, as well as the structure of larva, fishes, mollusks and leaves of plants :—

SOLUTION A. 1; (which may be kept in wooden casks.)

Rock Salt	40 oz.
Nitre (nitrate of potassa)	4 oz.
Soft water	1 gallon.

This is the final solution in which all invertebrate animals must be preserved. A solution with double the amount of water may be kept, and called A. II.; another, with three gallons of water, will be A. III.

SOLUTION B. 1.

Soft water	1 gallon.
Solution A. 1	1 quart.
Arseniate of potassa	1 oz.

Another solution, with double the amount of water, may be made, and called solution B. II.

To preserve insects with these solutions, they are placed first in solution B. I., but if the weather be cool it would be better to first employ B. II. If the specimens rise to the surface they should be kept under by by mechanical means. After remaining for several hours, or a day (varying according to the size and the weather), in the B. I. solution, they may be transferred to A. III., and then successfully to A. II. and A. I., and when thus fully preserved they may be transferred to a fresh portion of the last solution, which has been filtered clean and bright, and put up in a cabinet, when no further change will be necessary, if the bottle or other vessel be properly secured to prevent the escape of crystallization around the opening. To prevent this, the stopper, whether of cork or glass, together with the neck of the bottle, may be covered with a solution of paraffine, or wax in turpentine, or benzole, which should be applied only when the surfaces are quite dry and clean. The length of time that any specimen should remain in each of the solutions is usually indicated by their sinking to the bottom when saturated with it. In many cases but two solutions below A. I. will be effectual.

ANNUAL GENERAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF CANADA.

The Annual General Meeting of the Society was held, by invitation of the London Branch, in their Rooms, City Hall, London, Ontario, on the 7th of July, at 3 p.m. The President, Professor Croft, occupied the chair, and the following members were present:—From Toronto, Messrs. Sangster, Clementi, Bethune, and Osler; from London, Messrs. Saunders, Reed, Barber, Griffiths, Puddicombe, Denton, Chapman, Waterman, and Simpson.

The Secretary-Treasurer read the minutes of the last meeting, the Financial Report, and the Reports of the Quebec and Toronto Branches; on motion, they were adopted as read. Letters of apology for non-attendance at the meeting were read from various members who were unable to be present, and a communication respecting the 17th Annual Meeting of the American Association, to be held at Chicago, in August.

The meeting then proceeded to the election of officers for the year 1868-9, with the following result:—

President—Professor Croft, D.C.L., University of Toronto.

Vice-Presidents—Johnson Pettit, Esq., Grimsby; Wm. Saunders, Esq., London.

Ex-officio Vice-Presidents—Rev. O. Brunet, President, Quebec Branch; J. M. Denton, Esq., President, London Branch.

Secretary-Treasurer—Rev. C. J. S. Bethune, M.A., Credit, Ontario.

Curator—W. H. Ellis, Esq., B.A., Toronto.

Council—G. J. Bowles, Esq., Secretary, Quebec Branch; E. Baynes Reed, Esq., Secretary, London Branch; J. H. Sangster, Esq., M.D., Normal School, Toronto.

Several American Entomologists of note were then nominated for election as Honorary Members at the next meeting.

After some discussion, a resolution was unanimously passed respecting the publication by the Society of a small periodical to be called the "CANADIAN ENTOMOLOGIST," under the editorial management of the present secretary of the Society.

At six o'clock the meeting adjourned till 8 o'clock p.m., when the members proceeded to the examination, comparison, and discussion of Longicorn Coleoptera. Large and interesting collections of this family of insects were exhibited by Messrs. Saunders, Croft, Bethune, Reed, Sangster, and Clementi, representing nearly all the species enumerated in the Society's list as Canadian, and also a few not before taken in this country. A few Lepidoptera new to Canada, an interesting collection of Larvæ prepared by Mr. Saunders, many beautiful works on Entomology, including Dr. Glover's unpublished plates of Lepidoptera, and other objects of interest

were also exhibited; these, together with the microscope, pleasantly occupied the members for a few hours, when the meeting adjourned.

The following morning, Wednesday, July 8, the members met at 8.30, and drove a few miles into the country for an entomological field day and picnic. On arriving at the selected place all betook themselves to the woods, fields and river side, and spent a few hours in the capture of insects of various orders; many rare and interesting specimens were taken, and fair success was attained by all. At mid-day they re-assembled for lunch, which was kindly provided by the London members; and, after it had been duly discussed and enjoyed, another sally was made upon the insects of the neighborhood, till the time of departure arrived. Two photographs of the members, in a group, were taken by Mr. Griffiths, as a memento of this first pleasant gathering under the new constitution.

In the evening, the members re-assembled at the residence of Mr. Saunders, and spent a few hours very agreeably with the microscope and in the examination of his large and beautiful collection.

The next day, Thursday, a few of the members made an excursion to "The Ponds," a few miles south of London, and captured a number of very interesting specimens, including several of *Polyommatus epixanthe*, which abounds in that particular locality. This brought to a close a most agreeable re-union of the members of the Society, which will long be remembered by all who took part in it. The members from a distance all expressed themselves highly delighted with the unbounded hospitality and kindness of their London friends.

EXCHANGES.

I have about 100 good specimens of *Melitæa phaeton*, which I wish to exchange for any of the species of *Papilio, Pieris protodice, Grapta interrogationis*, any of the *Lycænidæ* (except *phleas*) and *Deiopeia bella*. I have an abundance of many of our common butterflies, mostly good specimens, collected in season, and by the end of August I hope to have a pretty heavy stock on hand for exchange.—E. Billings, Ottawa, Ont.

Mr. Peck, of New York, desires to obtain good specimens of the following: *Pieris rapæ*, *Melitæa Harrisii* and *Nycteis, Chionobas balder, Thecla mopsus, augustus, acadica*, and *læta, Polyom. porsenna*, and *lucia, Lycæna Chlotilde, Hesperia* (various species), *Arctia, Catocala*, &c.; for these, good specimens of U. States *Lepidoptera* will be given.—Apply to the Rev. C. J. S. Bethune, Credit, Ont.

The Canadian Entomologist.

VOL. I. TORONTO, SEPTEMBER 15, 1868. No. 2.

NOTES ON CANADIAN LEPIDOPTERA.

BY THE EDITOR.

Two lists of Canadian Lepidoptera have been published by our Entomological Society; the first one, prepared by Mr. W. Saunders and issued in 1864, contained the names of all the Butterflies, Sphinges, and Bombyces then known to inhabit this country; the next year a second list, prepared by ourselves, was issued, containing the names of species in the remaining families of moths, and some additions to the former list. Since then a number of new species have been captured in this country, whose names may now be added to our lists; great changes have also been made in the generic nomenclature of others, and in some cases the very species has been proved to be erroneous and to require correction. On these grounds it is necessary that the lists should be revised and corrected preparatory to the publication of new ones at some future period; this we now propose doing as far as our own materials extend, trusting that others will lend their assistance and make the corrections and additions as complete as possible. With regard to the substitution of new generic names, while we make the alterations in order that we may not be "behind the times," we yet cannot but think that this endless splitting up of old and well known genera into numberless new ones is a serious drawback to the study of entomology. At the present rate we shall soon have a separate genus for each species, as is already very nearly the case in some families, further than which sub-division can hardly go.

1. ARGYNNIS ATLANTIS, Edwards.—This beautiful butterfly, which somewhat resembles our well-known *A. aphrodite*, is figured in Mr. Edwards' magnificent new work on the "Butterflies of North America." He states that "it is found in the mountainous districts of New York, and in British America at least as far north as Rupert's House, Hudson's Bay, and Lake Winnipeg." It was taken by Mr. Saunders, below Quebec, in 1866.

2. CHIONOBAS JUTTA, Moschler.—Mr. Scudder, in his revision of this genus (Pro. Ent. Soc. Phil. v. 3–5), states that this name should be substituted for *C. balder*, Bois. & Lec., which is on our first list. It has been taken in the neighbourhood of Quebec.

3. THECLA STRIGOSA, Harris, Ins. Mass. p. 276.—Mr. Saunders has succeeded in raising this insect from the larva, which fed on thorn.

4. THECLA CALANUS, Westwood.—Messrs. Grote & Robinson in the Trans. Am. Ent. Soc. i. 172-3, state that they "have the male *T. calanus* from Canada, under the, they believe, unpublished name of *T. Edwardsii*, Saunders;" they consider that *T. Falacer*, as described by Harris, should probably be referred to this species,—Godart's species, as illustrated by Boisduval and Leconte, not corresponding to it.

5. THECLA INORATA, Grote & Rob.—These writers in a later part of the Trans. Am. Ent. Soc. (i. 323), describe *T. falacer* of Boisd & Leconte's *plate* as a new species under the above name, and state that the *T. Falacer* of Godt. and Boisd. and Lec., *text*, is *T. calanus*. Both species have been taken in Canada. All our own specimens which we had labelled *T. falacer* are *T. inorata* G. & R.

6. LYCÆNA PEMBINA, Edwards.—Taken by Mr. Saunders at Cacouna in 1866 (*vide* his paper).

7. LEPISESIA FLAVOFASCIATA, Walk.—Described by Walker under the genus *Macroglossa* (C. B. M. viii. 87), but erected by Mr. Grote into a new genus as above (Pro. Ent. Soc. Phil. v. 39). Specimens of this insect taken in Canada are in the collection of the Ent. Soc. Phil.

8. HÆMORRHAGIA GRACILIS, Grote & Rob.—Described from specimens obtained by Mr. Saunders in Canada West (Pro. E. S. Phil. v. 175, pl. 3, figs. 1 and 2).

9. HÆMORRHAGIA THYSBE, Fab.—This is on our list as *Sesia pelasgus*, Cram.; the specific name of *Fabricius* has the priority, while the new generic name is given by Grote & Robinson to this and three other species, the genus *Sesia* being by them restricted to *S. diffinis*.

10. AELLOPOS TANTALUS, Linn.—In our list as a *Macroglossa*, placed under Hübner's genus by Grote (Pro. E. S. Phil. v. 42). Our specimen, a somewhat mutilated one, was taken by Mr. Pettit at Grimsby in 1864; we have never heard of any other being taken so far north.

11. THYREUS ABBOTII, Swains.—This handsome insect has been captured at Hamilton, Ont.

12. AMPHION NESSUS, Cram.—In our list as a *Thyreus*, belongs to Hübner's genus *Amphion*.

13. OTUS CHŒRILUS, Cram.—Hübner's generic name has here also priority over the name *Darapsa*.

14. OTUS MYRON, Cram.—In our list *Darapsa pampinatrix*, Smith. Cramer's specific name has priority over Smith's.

15. OTUS VERSICOLOR, Harris.—Removed from *Darapsa* to this genus (Grote Pro. E. S. Phil. v. 81).

16. PHILAMPELUS PANDORUS, Walk. (*P. satellitia*, Harris.)—*Satellitia* Linn., is a South American species, and not that figured by Harris (*vide* Grote & Rob. Trans. Am. E. S. ii. 76). This magnificent Sphinx was captured in 1866 by the Rev. V. Clementi, at Lakefield, North Douro, Ont.; as it has been taken so far north it is likely to occur in other parts of the country where the grape is cultivated.

(To be continued.)

ENTOMOLOGICAL NOTES DURING A TRIP TO SAGUENAY.

BY W. SAUNDERS.

During the summer of 1866 we found ourselves among those who were trying to escape the hot weather of July by a trip to the Saguenay. The few hasty notes of insects taken during this journey must necessarily be very imperfect, since a day or two at most was all the time that could be devoted to any one locality.

During the down trip there were no opportunities for entomological observations. On the evening of July 10th we reached the mouth of the Saguenay, and early on the following morning the steamer *Magnet* landed us at Ha Ha Bay. I was surprised to find that *Pieris rapæ*, so lately introduced into Quebec from Europe, had found its way so far down as this; it was the commonest butterfly here. During a twelve miles journey across the country to Chicoutimi it still prevailed, flying about the gardens and cultivated fields—in no great abundance anywhere, but commoner than any other species. How much further north it extended I was not able to ascertain.

After spending two days in this neighbourhood we returned on the third to Tadousac and from thence to Cacouna, remaining two or three days in each place. The following list embraces all the species observed, with localities:

Papilio turnus, Linn.—Tadousac, not uncommon.

" *asterias*, Fab.—This insect was not seen on the wing, but two specimens of the full grown larva were taken at Cacouna.

Pieris rapæ, Linn.—Ha Ha Bay, Chicoutimi, Cacouna, common. It is rather remarkable that this insect was not seen at all in Tadousac.

Colias philodice, Godt.—Tadousac, common. Cacouna, not so plentiful.

Argynnis atlantis, Edwards.—Cacouna, rather common, but very wild and difficult to capture.

Argynnis myrina, Cram.—Cacouna, abundant.

Melitæa Harrisii, Scud.—Ha Ha Bay.

" *tharos*, Cram.—Ha Ha Bay, Cocouna, common.

Vanessa Milberti, Encyc.—Ha Ha Bay.

Pyrameis cardui, Linn.—Cacouna.

Lycæna pembina, Edwards.—Two specimens of this rare insect were taken at Cacouna on the 19th of July, one in tolerably good order, the other much beaten. At the same time a larva was taken feeding on a blue vetch, very abundant there *(vicia cracca)*, which I strongly suspect to be the larva of this species. Several specimens were secured, but a series of mishaps prevented my rearing any of them. I append a description, with the hope that some entomologist may before long meet with it again.

Length 0.50 in., onisciform.

Head very small, brownish black, drawn within the second segment when at rest.

Body above delicate pink or flesh color, thickly covered with very short fine pink hairs scarcely visible without a magnifying glass, a brownish red dorsal line from third to terminal segments, widest and darkest on anterior segments. Second segment pinkish anteriorly, with a patch of dull green behind just in front of the dark dorsal line on third segment. On each side are eight short brownish red lines, these on third and fourth segments being placed nearly parallel with the dorsal line, those behind extending obliquely down the sides and edged above with dull white. A lateral line of dull white close to under surface extending on each side from third to terminal segments, fainter on anterior segments.

Under surface greenish along the middle bordered with pink, which shades gradually into a pinkish red line, lying close to the white one which forms the boundary of upper surface; feet greenish faintly tipped with brown; prolegs green.

Specimens less than half grown have a decidedly greenish tint, with a dark reddish brown dorsal line; the laternal lines with that close to under surface are of a whitish green with a tinge of yellow; under surface dark green with a brownish red line underlying the greenish white one which borders the upper surface.

Half grown specimens are pinkish with a tint of green, as they grow older they gradually assume the delicate pink of the full grown specimen.

Polyommatus Americana, D'urban.—Cacouna.

Nisoniades persius, Scud.—Ha Ha Bay.

Hesperia mystic, Edwards.—Ha Ha Bay, Cacouna.

Alypia Langtonii, Couper.—Cacouna.

Ctenucha virginica, Charp.—Ha Ha Bay.

Spilosoma Virginica, Fab.—Ha Ha Bay.

Saturnia polyphemus, Fab.—Ha Ha Bay.

Crocota ferruginosa, Walk.—Cacouna.

Agrotis suffusa, W. Verz.—Ha Ha Bay.
Ennychia octo-maculata, Linn.—Cacouna.
Angerona crocaotaria, Guen.—Ha Ha Bay.
Corycia albata, Guen.—Cacouna.
Melanippe gothicata, Guen.—Abundant between Ha Ha Bay and Chicoutimi, common also at Tadousac and Cacouna.
Scotosia undulata, Linn.—Tadousac, Cacouna.

Besides these about twenty-five undetermined species were taken, chiefly small moths.

Coleoptera.

Cicindela longilabris, Say.—On the road from Ha Ha Bay to Chicoutimi.
" *limbalis*, Lec.—Taken along with *longilabris*.

I did not anticipate the occurrence of this insect here. The only locality I knew for it before was at Port Stanley, on Lake Erie, and I did not imagine it had so wide a range.

Cicindela vulgaris, Say.—Tadousac, Cacouna.
Notiophilus 9 striatus, Lec.—This interesting little insect was taken at Tadousac on the ground on the highest part of a pass through the hills, and a short cut from the wharf to the hotel.
Harpalus herbivagus, Say.—Cacouna.
Trichius piger, Fabr.—Ha Ha Bay.
Ancylochira nuttalli, Kirby.—Ha Ha Bay.
Melanophila longipes, Say.—Ha Ha Bay.
Upis ceramboides, Linn.—Ha Ha Bay.
Hylobius pales, Herbst.—Ha Ha Bay.
Attelabus analis, Illig.—Cacouna.
Clytus undulatus, Say.—Ha Ha Bay.
Monohammus scutellatus, Say.—Common everywhere.
Acmaeops proteus, Kirby.—Ha Ha Bay.
Leptura nigrella, Say.—Ha Ha Bay.
Leptura 8 notata, Say.—On road to Chicoutimi.
Galeruca rufosanguinea, Say.—Ha Ha Bay.
Chrysomela polygoni, Linn.—Ha Ha Bay.

In addition a few species still undetermined, and a few insects belonging to other orders, including

Bombus borealis.—Cacouna.
Daplix assimilata, Uhler.—Cacouna.
Eysacoris carnifex.—Ha Ha Bay.
Capsus 4 vittatus.—Ha Ha Bay.

THE LUMINOUS LARVA.

Respecting our notice of this singular insect in our first number the Rev. J. G. Morris, D.D., of Baltimore, Md., writes as follows :—"Judging from your description precisely a similar larva was brought to me a few years ago for investigation. As it belonged to a public museum I could not retain it for daily observation and feeding, neither had I time to go and watch its habits. I presumed, however, that it was full fed and would soon change. A few days after I went to make enquiry and was told that the bottle with earth had been thrown out, and on further asking they told me 'the worm wasn't there any longer;' on pressing my questions the stupid fellow said that 'there was a ball of earth almost as round as a marble, which he had not seen before, in the glass jar, but not knowing what it was he had emptied the whole concern into the street!' I have no doubt that the ball was the work of the larva in which it had enclosed itself, but it was irrecoverably lost. I made no description of the insect, but yours suits it precisely. Do the *Lampyridæ* cover themselves with dirt, as the *Geotrupidæ*, for example, in undergoing their transformation? If so, then we have one presumptive proof that the larva belonged to that family, but it is best not to be too rash in our conclusions. I very much regret that I can give you no more satisfactory information."

A few days ago (Sept. 3) we had the great good fortune to find a wingless female Fire-fly, whose tail segments were luminous. We must defer an account of it for the present.

NOTICE OF ENTOMOLOGICAL WORKS.

THE AMERICAN ENTOMOLOGIST. Edited by B. D. Walsh and C. V. Riley. Published monthly by R. P. Studley & Co., 104 Olive Street, St. Louis, Mo. September, 1868.

The first number of a new periodical on practical entomology, edited by the State entomologists of Illinois and Missouri, is now before us. We gladly welcome its advent as a worthy successor to our old friend the *Practical Entomologist*, whose discontinuance was a source of much regret to us, and trust that it may long continue to flourish as a worthy and useful exponent of the true history and habits of the myriad insect friends and foes to the gardeners and farmers of this continent. Time was when to be an entomologist was to render oneself a source of anxiety and care to one's friends, and an object of pity or derision to one's neighbours; but now, happily, people in general are becoming rather more enlightened, and do not think that a man has a bee in his bonnet because he catches butterflies; is it because they find that insects draw so

largely upon their pockets, and devastate their fields and gardens if not looked after and repressed? That they do abstract annually enormous sums from the wealth of the country, our editors show us plainly in their opening article; they state, and we do not suppose they are far wrong, that the United States lose $300,000,000 per annum by the depredations of noxious insects! Their object in issuing this new periodical is to show the people how to save a small proportion, at any rate, of this vast sum, and teach them how to fight with the best prospects of success their tiny but countless foes. The official position of these gentlemen, as well as their various published writings, are a sufficient guarantee for the character and usefulness of their journal; the hearty co-operation of the public is all that is needed for its success. The number before us consists of twenty large octavo pages; it is written in a clear and lively style, and is illustrated by nine excellent wood-cuts. It is to be published once a month, and will be profusely illustrated by original drawings from the pen of Mr. Riley, and at least one colored lithographic plate will be given with each volume. For the convenience of subscribers in Canada we have consented to act as agent for this Province; on receipt of one dollar we shall furnish it, *free of Canadian and American postage*, for one year—the difference of exchange covering the postage on both sides of the line. The title *American Entomologist*, should be particularly mentioned to prevent any confusion with our own publication.

BOOKS RECEIVED:—*On the Development of a Dragon Fly (Diplax)*, and *On the Structure of the Ovipositor and Homologous Parts in the Male Insect*. By A. S. Packard, jun., M. D. From the Pro. Soc. Nat. Hist., Boston, 1868.

The author will please accept our thanks for the copy of these valuable papers that he has kindly sent us.

The Maine Farmer. Augusta, Me., Sept. 3, 1868.

TO CORRESPONDENTS.

M. S. R., Wooler, Ont.—Your name will be submitted for election as an ordinary member of the Entomological Society of Canada at the next meeting. The best works that we can recommend to you to begin with are Packard's *Guide to the Study of Insects*, now being published in parts at 50 cts. each, and Harris' *Insects Injurious to Vegetation*; other works, of course, will be required as you go on. As a general introduction to the study, you should read Kirby and Spence's Entomology, a valuable and highly entertaining work to any one who cares at all for natural history. We shall be happy to procure Dr. Packard's work for you if you desire it; two parts are now published.

B. B., Ottawa; J. N., Belleville; J. R., Montreal.—A large supply of sheet cork has been ordered from England; we expect its arrival about the middle of next

month; till then we pray your patience. We have still several thousand pins left of Nos. 2, 3 & 4.

C. Wallbridge, Belleville.—The specimens left by you at the Canadian Institute some little time ago are the following: The large moth is the American Silkworm, or Eyed Emperor *(Telea polyphemus)*; a full account by L. Trouvelot of its habits, transformations, and the most successful mode of rearing it, is contained in the *American Naturalist*, Vol. I., Nos. 1, 2 & 3; there is also a short notice of it, with a figure of the moth, in the *Canada Farmer*, 1866, p. 181. The gigantic water-fly is a fine male specimen of the Horned Corydalis *(C. cornutus)*; its larva is commonly called a "Crawler," in the Western States a "Hellgramite,"—whatever that means—and is a capital bait for bass, etc.; there is an illustration and notice of it in the current number of the *Canada Farmer*. The smaller water-fly is a species of *Perla*, often found in the earlier part of summer, fluttering about the banks of rivers, and settling on stones, aquatic plants, or any other convenient resting-place. Its larva lives in the water, generally hiding itself under stones, and feeds upon small insects; it exists through the winter, and changes to a pupa in the Spring; before assuming the winged state it crawls out of the water and leaves its empty case behind, when it flies away to enjoy its brief life in the air; the empty shells are often to be found on bridges and the margins of streams. We shall be happy to receive specimens from you at any time.

SUBSCRIPTIONS to Vol. I. have been received, with thanks, from the following:—Rev. Dr. G., Wellington Square; T. P., Berlin, Ont.; Rev. F. A., Guelph; Prof. H. Y. H. and D. H. H., Windsor, N. S.; V. S. C., Covington, Ky.; S. H S., Boston, Mass., who kindly writes, "Please put my name down for a copy of the CANADIAN ENTOMOLOGIST—even if it is to be published at $5 per volume." We have also received the following subscriptions to Vol. I. through Mr. Saunders:—L. S., D. H. M., and Judge L., Hamilton; D. W. B., St. Catharines; C. A., Paris, Ont.; A. M. S., Grimsby.

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Suitable advertisements will be inserted on reasonable terms.

N.B.—Correspondence is invited respecting the habits, localities, occurrence, etc., of insects, as this journal is intended to be a medium for the recording of observations made in all parts of the country; insects for identification will be gladly attended to and returned when desired. Any contributions to the publication fund will be thankfully received and gratefully acknowledged.

All communications, remittances and exchanges, should be addressed to "THE REV. C. J. S. BETHUNE, *Credit, Ont., Canada.*"

The Canadian Entomologist.

VOL. I. TORONTO, OCTOBER 15, 1868. No. 3.

NOTES ON CANADIAN LEPIDOPTERA.

BY THE EDITOR.

(Continued from page 11.)

17. CRESSONIA JUGLANDIS, Smith.—This well known insect has been taken as the type of a new genus, worthily dedicated to Mr. E. T. Cresson, Philadelphia, by Messrs. Grote & Robinson, (Pro. E. S. Phil. v. 186). Its structural differences from the other species of *Smerinthus* appear to fully warrant its separation from them.

18. MACROSILA QUINQUEMACULATA, Haw.—The transferance of this and several other American species to Boisduval's genus from that of *Sphinx* was made by Walker (C. B. M. viii. 198), and has since been concurred in by Clemens and Grote.

19. DAREMMA UNDULOSA, Walk.—This species has given rise to an extraordinary amount of confusion and difficulty. Mr. Walker himself has stated (*vide* Pro. E. S. Phil. v. 189), that this "species is a mistake; it has been newly identified as a dwarfed and slightly aberrant specimen of Sphinx brontes." The specimens, however, from which he described his *M. brontes*, Drury, "differs much from Drury's figure, and may be a distinct species" (C. B. M. viii. 199); they have since proved to be Dr. Clemens' *Ceratomia repentinus*, which insect Grote & Rob. consider structurally distinct from the other species of *Ceratomia*. The question now is, what name is this unfortunate insect to bear? The last named authors (Trans. E. S. ii. 76) go back to *Daremma undulosa;* with all due deference we should say *D. repentinus* would be the more just designation, being Walker's genus and Clemens' species.

20. CERATOMIA AMYNTOR, Hübn.—This specific name appears to have priority over Harris' *C. quadricornis.*

21. SPHINX EREMITUS, Hübn.—This is the *S. sordida* of Harris; the former name has the priority.

22. SPHYNX CHERSIS, Hübn.—The *S. cinerea* of Harris.

23. ELLEMA HARRISII, Clemens.—This is the *Sphinx coniferarum* of Harris, who erroneously considered it to be Smith's species. We have a male specimen from London, Ont., and a female from Weston, Ont.

24. LAPARA BOMBYCOIDES, Walk.—This insect, which is very briefly described by Mr. Walker (C. B. M. viii. 233), and noticed as having been taken in Canada, is not mentioned by either Clemens or Grote; as the typical specimen is in a private collection it will be difficult to determine it or ascertain its specific value.

25. TROCHILIUM CAUDATUM, Harris.—This singular and beautiful insect we captured in our garden at Credit last summer; we have never seen but one specimen.

26. THYRIS VITRINA, Boisd.—This name is to be omitted from our List No. 2; it was inserted on the authority of Mr. Walker (C. B. M. viii. 73), but Grote & Rob. (Trans. Am. Ent. Soc. ii. 75) have shown that it is an erroneous determination of *T. maculata*, Harris.

We now proceed to the Bombycidæ, in which we adopt the order and revised nomenclature put forth by Dr. A. C. Packard, jun., in his valuable synopsis of this family (Pro. Ent. Soc. Phil. iii. 97-130, and 331-396).

27. GNOPHRIA VITTATA, Harris.—A synonym of *Hypoprepia fucosa*, Hübn (*Lithosia miniata*, Kirby), and therefore to be omitted from the list; the great difference in color between the two varieties led us to think for some time with Harris, Clemens and Fitch, that there were two species.

28. EUPHANESSA MENDICA, Walk.—This species, which was included by Walker and others in the genus *Nudaria*, has been erected into a new genus, by Dr. Packard (P. E. S. Phil iii. 102) upon satisfactory grounds.

29. CROCOTA RUBICUNDARIA, Hübn.—Grote & Rob. state (Trans. E. S. ii. 71) that the specimens referred by Walker to this species, are varieties of his *C. ferruginosa;* this statement is corroborated by Dr. Packard's account of the extreme variableness of the latter species (P. E. S. Phil. iii. 104). The name must therefore be omitted from our list until Hübner's species is satisfactorily shown to have been taken in Canada.

30. UTETHEISA BELLA, Hübn. — This lovely little moth which was formerly known by the hard-to-be-pronounced name of *Deiopeia bella*, is now referred to Hübner's not much more euphonius name, his genus having the priority over Westwood's.

31. CALLIMORPHA CLYMENE, Esper.—In our list as a *Hypercompa*, which, it appears, was not intended by Hübner as the name of a genus, but of a group of genera.

(To be continued.)

A VISIT TO AMHERSTBURG, ONTARIO.

BY E. B. REED, LONDON, ONT.

Being recently on a visit to this pretty little frontier town, I devoted a few hours to my friends the resident Coleoptera and Lepidoptera, and well indeed were my labors rewarded, as the sequel will show. The season was rather advanced for Lepidoptera, but there must have been an enormous supply of their larvæ, for I noticed the fatal results of their "grubbing" powers on many of the surrounding trees; oaks, maples, hickory and walnut in particular, were filled with larvæ of *Dryocampa senatoria*, *D. stigma*, *D. rubicunda*, *Halesidota caryæ*, *H. tesselaris*, and a variety of species unknown to me by name, though we have taken several similar ones near London, but have failed to rear them.

Hearing that a lady in the town had a few specimens, I obtained an introduction from a mutual friend, and soon was busy at work upon the odds and ends of a most miscellaneous collection. Imagine my delight upon recognizing that magnificent insect, *Papilio thoas!* I was told that it was quite common there, and was made the lucky possessor of a fine specimen captured the week before, and I hope next season to procure a good supply of this rare insect. I also saw a very handsome Sphinx, *Chærocampa tersa*, caught on the vines in a neighboring garden, and a splendid specimen of *Catocala cara*, both of which species I am inclined to think are hitherto unrecorded as taken in Canada. From this collection I obtained a specimen of those rather uncommon beetles *Xyloryctes satyrus* and *Saperda cretata*, captured at Paris, Ont.; I also took several moths, new to me, and shall endeavor shortly to procure their names. I do not know whether other localities were visited in the same way, but Amherstburg seemed literally to swarm with *Danais archippus*, reminding me of a similar occurrence in Toronto about seven years ago. From all appearances a rich harvest might be reaped by an energetic collector in this hitherto ungleaned field.

The following were obtained by me:—Lepidoptera—*P. asterias*, *P. turnus*, *P. oleracea*, *P. protodice*, *C. philodice*, *D. archippus*, *V. milberti*, *V. progne*, *L. disippus*, *A. cybele*, *M. tharos; Catocala amatrix*, *C. parta*, *Arctia Saundersii*, *A. phalerata*, and several of the Noctuidæ not yet determined by me through want of leisure. Coleoptera—*Pelidnota punctata*, *Clerus nigripes*, *Leptura Canadensis*, *Saperda vestita*, *Ligyrus relictus*, *Clytus campestris*, *Cassida pallida*, *Hippodamia maculata*, *Chrysomela Bigsbyana*, *Diabrotica vittata*, *Macrobasis Fabricii*, several *Graphisuri*, and a most wonderful Curculio with a very alarming snout longer than its body, and the thickness of a horse-hair, belonging, I believe, to the genus *Balaninus;* and lastly two new *Chrysomelidæ*. I

should have been greatly pleased if I could have spared time in investigating this fine ground, but the weather was not very favorable, and my time was limited.

DESCRIPTION OF THE LARVA OF CALLIMORPHA LECONTEI,

Taken June 10th, 1868, feeding on Horse Gentian *(Triosteum perfoliatum.)*

Length, 1.10 in., nearly cylindrical.

Head rather small, bilobed, black and shining, with a few short hairs, mandibles black, palpi pale brown tipped with black.

Body above black, with transverse rows of elevated shining black tubercles, from each of which arises a spreading tuft of short bristly hairs; a bright yellow dorsal stripe, and a wide band of the same color on each side, this latter intersected with streaks and centered with a broken band of black; about half-way between the dorsal and lateral stripes is a row of pale whitish dots, forming a faint broken line.

Under surface dirty greyish white, with streaks and dots of brown, feet black, prolegs dirty white on inside, with a patch of shining black on the outside of each.

These larvæ entered the chrysalis state on the 19th and 20th of June, and produced the imago on the 12th and 14th of July. Four specimens were reared, and the moths were as nearly alike as possible, showing no tendency to the remarkable variations attached to this species.—W. SAUNDERS, London, Ont.

DESCRIPTION OF A LARVA FOUND INFESTING THE SEED OF THE GRAPE.

In the last number of the *Canada Farmer* will be found as full an account as we can yet give of the history and distribution of this insect which threatens to interfere seriously with the culture of the grape in some parts of our country. As there stated, it is probably the larva of a small species of curculio. Knowing that accurate scientific descriptions of such insects are scarcely suitable for a popular agricultural paper, I have referred the readers of *The Farmer*, who wish to pursue the subject further, to the present number of *The Entomologist*.

Usual length about one-twelfth of an inch, greatest width about one-third of the length.

Head rather small, smooth, whitish, semi-transparent; mandibles hook-like and sharp pointed, dark brown, with a patch of brown at their base.

Body above and below milk-white, semi-transparent, with a shining surface, distinctly annulated, widest along the middle segments, tapering towards

each end. The hinder edge of each segment is raised as if slightly lapping the one behind it. Each segment has several short whitish hairs, only visible with a high magnifying power; these are most numerous on anterior segments. The two hinder segments are smaller than any of those on anterior part of body, feet and prolegs wanting.

The larva is very sluggish in its habits, and will often remain a long time motionless unless disturbed.—W. SAUNDERS, London, Ont.

MISCELLANEOUS NOTES.

A NEW THECLA.—In July last, while staying at Port Stanley, Ont., I captured a *Thecla* on the common garden Spiræa; at first sight I supposed it to be only *T. Falacer*, but on closer examination, when setting it up, I discovered some new points which, in my opinion, marked it as a fresh addition to our Canadian list. I sent it accordingly to Mr. W. H. Edwards, of Western Virginia, and I have much pleasure in stating that he considers it a new species, and has given it the name of "Thecla Ontario." A plate and description of this interesting capture will be given shortly in the Transactions of the American Entomological Society.—EDMUND BAYNES REED, London, Ont.

CAPTURE OF PIERIS RAPÆ IN THE U. STATES.—Mr. Saunders writes in No. 2 that he took *P. rapæ* below Quebec in 1866; I have taken it this year at Lewiston, Me., and Montpelier, Vt. It was more plentiful in July and August than any other species. I noticed at both places that it was only to be found very near the city, one mile into the country beyond the cultivated kitchen-gardens I did not see a single specimen; possibly its larva lives on cultivated plants. It is well worth noticing its advance north and south, and recording the facts, so that if any change in its markings or color takes place from the extremes of climate, future Entomologists may have data to go upon. As plentiful as *Pieris oleracea* is in Northern Vermont, I have never known it taken in this part of Massachusetts; possibly *P. rapæ* may not spread as far south as here.—PHILIP S. SPRAGUE, Boston, Mass. [The food-plants of *P. rapæ* are cabbages, mignionette, nasturtium (Tropæolum), and various Cruciferæ. It has proved very destructive to cauliflower and cabbage plants in the neighborhood of Quebec. An interesting account of its first occurrence in this country is given by Mr. Bowles in the *Canadian Naturalist* for August, 1864. ED.]

DARAPSA OR OTUS, which shall it be?—A correspondent reminds us that the generic name *Otus* (Nos. 13, 14 and 15 in our "Notes on Lepidoptera") is pre-occupied in Ornithology, having been applied as far back as the days of Aristotle to the horned or eared owls. The usual

rule is that no generic name shall be applied to more than one genus in any branch of Natural History, and hence Hübner's name for these Sphinges will have to be dropped, while we return to the more familiar apellation *Darapsa*. The present rules of nomenclature are highly unsatisfactory and occasion naturalists an immense amount of useless labor; we do hope that something may be done at the next meeting of the American Association to improve matters.—Ed. Can. Ent.

Papilio Machaon in British America.—I do not know whether the Canadian Entomologists are aware that *P. machaon* is found in British America. Some years ago I received several taken by Mr. Drexler at Rupert House, Hudson's Bay.—Wm. H. Edwards, Coalburgh, Kanawha Co., West Virginia.

NEW ENTOMOLOGICAL WORKS.

A Guide to the Study of Insects, and a Treatise on those Injurious and Beneficial to Crops.—For the use of Colleges, Farm-schools, and Agriculturists. By A. C. Packard, jun., M. D., Salem: Press of the Essex Institute. Parts 1 and 2, 1868. Price 50 cents each.

This new work by Dr. Packard supplies collectors and students of insects in America with what they have long searched for in vain—a thoroughly good, reliable, well-illustrated manual of structural and systematic Entomology, prepared by one who is a master in the science. We most strongly recommend all our readers to become subscribers to this work, and we assure them that they will find an abundant fund of interest and instruction. The two parts already issued contain clear and concise descriptions of the anatomy, transformations, geographical and geological distribution, diseases, &c., of insects; directions for collecting and preserving specimens; a list of works on Entomology; tables of classification; and the beginning of a systematic account of the order Hymenoptera. They are illustrated by 78 well-executed wood-cuts and two full-page plates; each part consisting of about 64 clearly printed pages. The work is to be completed in 8 or 12 parts, issued at short intervals; the author particularly desires that subscribers would remit for eight parts at once ($4 in U. S. currency), and thus materially assist the publishers in getting out the work.

The Butterflies of North America: with colored drawings and descriptions. By W. H. Edwards. Philadelphia: the American Entomological Society. Part 1, April, 1868. Price $2.

It would be difficult indeed to produce anything more beautiful or true to nature than these exquisite drawings of butterflies; they vie in excellence with any European work that we have seen. Mr. Edwards, we

understand, apart from his scientific attainments, has the finest collection of North American Diurnal Lepidoptera in existence. We can, therefore, have full confidence in his ability to carry out satisfactorily the magnificent work he has undertaken, of which the part before us is a worthy beginning. This part contains five large quarto plates of various species of *Argynnis*, viz.: *A. Diana*, *Cybele*, *Aphrodite*, *Nokomis* and *Atlantis*, accompanied by descriptive letter-press of a valuable character. It is noteworthy that little or nothing is known of the larvæ of any of these five species, shewing us how much still remains to be done by Entomologists, and how far even the Butterfly field is from being worked out. Though the work is necessarily costly, it is yet one which no Lepidopterist can afford to be without, while at the same time it deserves the hearty support of all Entomologists, no matter to what order they devote their attention. Its publication at intervals of three months renders the expense of the subscription less onerous than were it to appear more frequently.

EXCHANGES.

EUROPEAN NEUROPTERA.—Mr. R. McLachlan (20, Limes Grove, North, Lewisham, London, S. E., England, the well-known student of Neuroptera, desires to exchange European insects of this order for Canadian ones,—*Phryganidæ* especially desired, but all will be acceptable. Specimens for transmission may be sent to the Editor of this Journal, REV. C. J. S. BETHUNE, Credit, Ont.

CARABIDÆ.—I should like to open a correspondence with any Entomologist in regard to exchanges of Coleoptera, especially *Carabidæ*. —PHILIP S. SPRAGUE, 141 Broadway, So. Boston, Mass.

LEPIDOPTERA.—Canadian Lepidoptera, especially species of *Catocala* (*C. relicta* in particular) desired in exchange for American Lepidoptera. —JAMES ANGUS, West Farms, N. Y.

LEPIDOPTERA.—In addition to the species mentioned in No. 1, Mr. G. W. Peck, of New York, desires the following:—*Arctia parthenos*, *Catocala relicta*, *C. briseis*, *Lycæna pembina*, and other more northern or eastern Lepidoptera. Good U. S. specimens in exchange. Apply to the EDITOR C. E.

TO CORRESPONDENTS.

M. S. R., Wooler, Ont.—Your specimens reached us in good order, thanks to careful packing. No. 1 is a rare wood boring beetle whose larva infests the Lombardy poplar, Balm of Gilead, and other trees; its name is *Prionus brevicornis*, Fab.; we should be glad of more specimens of it, if you have them to spare. No. 2 is, as you thought, the larva of

the Cecropia Emperor Moth *(Samia cecropia*, Linn). No. 3, Larva of the Yellow-necked Apple-worm *(Datana Ministra)*. No. 4, Larva of the Apple Buprestis, Borer *(Chrysobothris femorata)* which is very destructive to young trees in many parts of the country. No. 5, a true Bug *(Hemiptera)* in its wingless state. We do not know its name. There were also enclosed three caterpillars, without numbers attached; they had so lost their colors from preservation in alcohol that we were unable to determine them with certainty.

SUBSCRIPTIONS to Vol. I. have been received, with thanks, from the following :—Rev. R. B., Hamilton; Dr. R. R. S., Komoka; L. L., and H. R. W., Winona (per Mr. Pettit); G. W. P., New York; P. S. S., Boston, Mass.; J. C. O'R., T. K., O. J. P., St. Catharines; W. H. M., Coalburgh, Va. Subscriptions to the *American Entomologist* from Dr. R. R. S., Komoka; W. H. M., Hamilton; R. N. B., Niagara; Rev. R. B., Hamilton; O. T. S., Wellington Square; T. K, and O. J. P., St. Catharines.

Letters received :—H. L. M., Malden, Mass. (Nos. 1 & 2 sent; 75 cents in U. S. currency—S. M. L., Garrettsville, Ohio, ditto; shall be glad to receive subscriptions from your neighborhood)—G. T. B., Quebec (a welcome letter)—T. M. T., Halifax, N. S., (Happy to hear of your safe return).

To meet the convenience of our Canadian readers we shall be happy to procure for them any of the Entomological works noticed from time to time in our columns; the cheaper publications will be sent *post free* on receipt of the prices mentioned. For sale, one copy of vol. i., several of vol. ii. of the *Practical Entomologist*, 50 cents each. We will furnish the *Canadian Entomologist* (50 cents) and the *American Entomologist* ($1.00), post-paid, for one dollar snd twenty-five cents ($1.25) per annum.

THE CANADIAN ENTOMOLOGIST is published, not oftener than once a month, by the Entomological Society of Canada at the following rates :—

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To non-members (in Canada), 50 cents per vol. of 12 nnmbers.

To non-members (in the United States), 62 cents per volume,—the additional 12 cents is for postage which has to be prepaid. (The ordinary U. S. fractional currency may be sent).

Extra copies, 5 cents each, 50 cents per dozen.

Suitable advertisements will be inserted on reasonable terms.

N. B.—Correspondence is invited respecting the habits, localities, occurrence, etc., of insects, as this journal is intended to be a medium for the recording of observations made in all parts of the country; insects for identification will be gladly attended to and returned when desired. Any contributions to the publication fund will be thankfully received and gratefully acknowledged.

All communications, remittances and exchanges should be addressed to "THE REV. C. J. S. BETHUNE, *Credit, Ont., Canada.*"

The Canadian Entomologist.

Vol. I. TORONTO, NOVEMBER 16, 1868. No. 4.

ENTOMOLOGICAL NOTES.

PAPER No. II.

BY W. SAUNDERS, LONDON, ONT.

While looking over some insects in Hamilton a few days since collected by Miss Mills, daughter of Wm. H. Mills, Esq., I was delighted at finding a specimen of *Libythea bachmani*, Kirtland, which is probably a variety of *L. motya*, Boisd. It was almost entire, though somewhat beaten. The young lady had taken it on the beach at Hamilton early in August. She found it settled on the sand, and it seemed at first partially torpid, but when captured used its wings freely in trying to escape. It is a very peculiar insect, with very long palpi. The following is a description of it.

Palpi very long, fully one fifth of an inch, formed like a beak-brown above, whitish below. Body dark brown, with a faint metallic hue ; paler below.

Wings angular, expand 1¾ inches. Primaries above dark brown, with three white spots arranged in a triangle near the tip. The upper interior one largest, oblong, irregular in outline, divided by the nervules at its upper edge, ; the lower is also oblong but smaller ; the exterior is smallest and irregular in form. On the interior of the wing, beyond the middle, are two large fulvous spots, the upper elongated, pointed at each end—the lower oblong, irregular, and divided near the middle by a dark brown nervule.

Secondaries above dark brown, with a large irregular fulvous patch across the middle.

Under side of primaries paler than upper, with the same white spots and fulvous markings, the latter somewhat larger and coalescing. The tip has a faint bluish tinge, with a slight iridescence.

Secondaries with a wide brown border on hind margin, above bluish, iridescent, streaked with brown.

This butterfly is quite new to Canada, never having been taken here before to our knowledge. It is found in Ohio and in some other parts of the United States

A short time ago I forwarded to W. H. Edwards, Esq., of Coalburgh West Virginia, several specimens of *Lycæna*, which I was in doubt about, for determination. Some were taken by myself about London, others had been received from J. Pettit, Esq., of Grimsby. In a recent letter Mr. Edwards informs me that the box was broken in transit and the specimens almost demolished, but he observed among the fragments wings of *Lycæna violacea* Edwards, one of which belongs to a female. This species resembles "*lucia*" in appearance; the points of difference between them are detailed at length by Mr. Edwards in the Proceedings of the Entomological Society of Philadelphia, vol. vi, p. 201 to 204. I incline to think that the specimens sent Mr. Edwards, which he has determined to be *violacea*, were from Mr. Pettit's collection, but cannot say positively.

These additions, with the new species referred to in the last number, by E. B. Reed, Esq., bring up our list of Canadian butterflies to eighty-five.

Philampelus satellitia.—One of our London Entomologists, J. M. Denton, Esq., has been so fortunate as to secure two specimens of the larva of this very rare insect this season. They were taken nearly full grown on the Virginia creeper (*Ampelopsis quinquefolia*), they were of the dark variety, about three inches long, blackish brown, with six large oval cream-colored spots on sides; these spots formed a very striking contrast with the general color. The usual caudal horn is replaced in this species by a smooth raised eye-like spot. One of these larvæ is now in chrysalis. Several years ago a lady brought me a specimen of the same larva, but I did not succeed in rearing it. These are the only instances known to me of the finding of this insect about London.

On the 11th of August I was collecting insects near Milton Junction, Wisconsin, on the Chicago and North Western Railway. While walking along the railroad track I observed a cocoon very like that of *Spilosoma Isabella*, fastened to the upper part of the stem of an annual plant which, in consequence of the intense heat of the summer, was prematurely withering. I was much interested in this pupa. Could it be Isabella? If it were it must either be the cocoon of a larva of last year's growth, which had spent the winter and nearly all the hottest part of the summer in the caterpillar state—a thought I could not for a moment entertain—or it must be from a larva of the present year, resulting from eggs laid late in June. Both these conclusions being beset with difficulties, I inclined to the view that it might be the pupa of an Arctian I had not met before. So it was carefully boxed up. Early in September, after my return

home, this box was examined and found to contain a genuine Isabella moth recently escaped from the chrysalis. If this insect had been left to nature would it have spent the winter in a torpid state; or would it have deposited its eggs and died before the severe weather came on?

But further. Early in September Mr. E. B. Reed, while collecting at Amherstburg, took a specimen of *Arctia phalerata*, Harris, and one of *Arctia Saundersii*, Grote. My specimens of *Saundersii* have invariably been taken in June and July, and having reared this insect through its several stages, I am conversant with its history. It appears in June, deposits its eggs early in July, and dies. The larvæ do not complete their growth the first season, some of them indeed do not acquire more than half their size when they hybernate for the winter; completing their growth early the following spring, when they enter the chrysalis state and appear as moths in June again. Probably the habits and history of *Phalerata* are similiar. How came it that these moths—good specimens too—were abroad in September? During the latter part of August I was surprised to find the imago escaping from some chrysalides of *Darapsa pampinatrix*, which were obtained from larvæ gathered late in July. I at first thought this might be an exceptional instance, but was soon convinced of the contrary by the appearance of a second brood of the caterpillars on my grapevines, in numbers far surpassing the earlier brood. I also observed the moth about on the wing. Some of them appeared so late that the larvæ have not had time to complete their growth and must necessarily perish. Only yesterday, October 8th, I found them not more than half grown, nearly frozen, clinging to the under side of the dry frosted leaves, which they could not eat.

About the middle of September a friend of mine who had laid aside some pupæ of *Sphinx quinquemaculata* for next year, was astonished to find the moths buzzing about in his box. They had all escaped. My esteemed friend Rev. C. J. S. Bethune, informs me that he has had a similiar experience with the pupa of *Sphinx cinerea*.

What is the occasion of all this? Can it be due to the unusual heat of the summer maturing these creatures before their time?

MEETING OF THE ENTOMOLOGICAL SOCIETY.

A meeting of the Society was held on the 10th inst. in the rooms of the Canadian Institute, Toronto; Mr. W. H. Ellis, Curator, in the Chair. After the reading of the minutes, the following gentlemen, nominated at the Annual General Meeting of the Society at London, were unanimously elected Honorary Members:—

E. T. Cresson, Esq., Secretary to the American Entomological Society, Philadelphia, Pa.

W. H. Edwards, Esq., Coalburgh, Kanawha Co., West Va.

Prof. Townend Glover, Agricultural Department, Washington, D. C.

Augustus R. Grote, Esq., New York.

Dr. George H. Horn, President of the American Entomological Society, Philadelphia, Pa.

Dr. J. L. LeConte, Philadelphia, Pa.

Dr. A. S. Packard, Jun., Editor *American Naturalist*, Salem, Mass.

C. V. Riley. Esq., State Entomologist of Missouri, St. Louis, Mo.

S. H. Scudder, Esq., Secretary, &c. to the Society of Natural History, Boston, Mass.

Benj. D. Walsh, Esq., M. A., State Entomologist of Illinois, Rock Island, Illinois.

The following gentlemen were also elected members :—

Marmaduke S. Richmond, Esq., Wooler, Ont., to be an Ordinary Member.

John Fletcher, Esq., Detroit Michigan, (late of Oakville, Ont.,) to be a Corresponding Member.

A vote of thanks was passed to F. Walker, Esq., of Elm Hall, Wanstead, Essex, England, for his kind donation of two boxes of specimens of various orders of British and Foreign insects.

A collection of *Cicindelidæ* was exhibited by the Rev. C. J. S. Bethune, after the examination of which, as well as of the new donations, the meeting adjourned.

NOTICE OF A STATION FOR MELITÆA PHAETON IN THE NEIGHBORHOOD OF OTTAWA, ONTARIO.

BY B. BILLINGS.

Early in July I accidently discovered a locality for this rare butterfly within two miles of the city limits. It is an open swamp, densely surrounded with coniferous trees, which are almost impenetrable except by a path which passes through them. It occupies an area of about eight or ten acres, with a few scattered trees of *Thuja occidentalis* and *Larix Americana*. The shrubs consist of *Alnus incana*, *Rhamnus alnifolius*, *Rubus triflorus*, *Ledum latifolium*, and an occasional clump of *Cornus stolonifera*, *Myrica Gale*, and *Salix candida*. The principal herbaceous plants are *Thalictrum cornuti*, *Chelone glabra*, *Platanthera hyperborea*, *P. dilatata*, *Cypripedium pubescens*, *C. spectabile*, and a few grasses and sedges *Aspidium Thelypteris* is very

abundant, and the surface to a great extent is covered with several species of our most common *Hypnum*.

This season I watched faithfully for the appearance of the imago, making occasional visits to the spot during the month of June. It was first observed on the 3rd of July, and between this time and the 20th I made five or six excursions, capturing during the period over 200 specimens. I seldom met with them on the wing, but generally resting on the alders or ferns. They were not difficult to capture, appearing quite tame, and when aroused would fly but a few yards and alight; even if one escaped from the net it would fly but a short distance, and could be easily recaptured. On dull days they were quite sluggish, sleeping exposed on the upper surface of leaves, and readily taken without the aid of the net.

It is not improbable that they are double brooded, the *larvæ* produced from the eggs of the second brood not appearing until the following spring. I conjecture this from the circumstance of having two years ago seen a female late in August or early in September.

MISCELLANEOUS NOTES.

Capture of Tremex Columba.—One of the objects which the promoters of the *Canadian Entomologist* had in view, in the establishment of that periodical, was, I apprehend, to convey information respecting the appearance of various insects, whether of common or of rare occurrence, within the limits of our province. Under this impression, I send you a notice of the capture of some specimens of the *Tremex Columba* in our village, a few days ago. Last March, an oak, measuring nearly three feet in diameter at the butt, was felled and chopped into cordwood lengths. One of the pieces, a portion of the main stem, was split up the other day, and placed close to a stove for immediate use. On being thus subjected to the influence of heat, several individuals of the insect, in the *imago* state, crept out, from various perforations, in a semi-torpid condition, that is to say, they appeared barely able to crawl about, and made no attempt to use their wings or even to hasten their pedal movements for the purpose of escaping capture. On further search *larvæ* were also discovered in the wood. I regret to add that all the specimens I found were females. Their length, exclusive of the ovipositor, was 1⅜ in. This is the first occasion of my discovering these insects in this locality.—Vincent Clementi, North Douro, Ont.

Luminous Larvæ.—With reference to our account of a Luminous Larva in No. 1, Mr. W. Couper, Ottawa, writes:—"I frequently found larvæ of *Lampyridæ* in daytime under moss and bark of decayed trees, but never noticed them produce light, as you describe. I do not recol-

lect seeing larvæ of *Lampyris* of the length of an inch and a-half. I enclose the exuvia of a larva of one of the genera of this family, which I found under bark here. Has it the form of your insect? I do not believe that the larvæ of *Lampyris* enclose themselves in cocoon-like balls such as are formed by the larvæ of *Geotrupes* and *Osmoderma*. As you can see from the exuvia, its transformation is evidently similiar to that of *Dermestes lardarius*, and other active Coleopterous larvæ." [Our larva was immensely larger and quite different from the owner of the exuvia sent us by our correspondent: his looks very like the larvæ of *Chauliognathus pennsylvanicus*, a very common insect here, figured in the last number of the *American Entomologist*, but we could hardly judge from a cast-off skin. We have, however, sent it, together with a luminous female captured by Mr. James Angus at West Farms, N. Y., and another taken by ourselves here, to Philadelphia, for identification.—Ed. C. E.

EXCHANGES.

European Diptera, &c.—I have a large number of English, European, and Exotic Diptera, entrusted to me for sale or exchange; in the latter case, Hymenoptera, particularly the parasitic species, and minute Coleoptera, are chiefly requested in return.—F. Walker, Elm Hall, Wanstead, Essex, Eng.

Coleoptera.—I have been collecting Coleoptera for many years past, but am still in want of many northern species; shall be glad to exchange.—J. Akhurst, 4½ Prospect Street, Brooklyn, N. Y.

Lepidoptera.—I wish to obtain any species of Labrador or other far north butterflies, for which I would make a good return. I have a large number of specimens of various *Catocalas*, which I would gladly exchange for the following species: *C. relicta*, *unijuga*, *uxor*, *epione*, *polygama*, *briseis*, *vidua*.—James Angus, West Farms, N. Y.

*** We insert lists of specimens for exchange *free of charge to subscribers*. Of course it is understood that an actual *quid pro quo* is not expected, but that all Entomologists are willing to help one another to the best of their ability, without making a mercenary transaction of the exchange.

NEW ENTOMOLOGICAL WORKS.

List of the Lepidoptera of North America. By Aug. R. Grote & C. T. Robinson. Part I. Philadelphia: American Entomological Society. September, 1868.

In 1860 the Smithsonian Institution published a catalogue of the described Lepidoptera of North America, prepared by Rev. Dr. Morris, which proved valuable to students of this order of insects. Since

then vast strides have been made in the study, a multitude of new species and new genera have been added to our Fauna, and thorough revisions of the synonymy, nomenclature, and natural affinities of many families have been published; a new list has thus become an absolute necessity to those who desire to keep up with the progress of the science. We are glad to find that Messrs. Grote & Robinson have undertaken the work, to properly accomplish which no more competent Entomologists could have been found.

The part before us contains the Sphingidæ, Ægeriadæ, Thyridæ, Zygaenidæ, and Bombycidæ; the Butterflies are soon to follow, but the remaining families of moths are to await the publication of monographic papers now in course of preparation. The list is clearly and beautifully printed in the same style as Dr. LeConte's Catalogue of Coleoptera. Among the Sphinges we notice that the name *Otus* has been dropped and *Darapsa* resumed, the former being preoccupied in Ornithology, as we observed in our last issue; in the case of *Daremma undulosa*, Walker's specific name is retained. The publication of this List will render unnecessary our doing more than merely referring to the changes of name in Canadian species in our notes on Lepidoptera, as the synonymy is fully given in regular sequence. Might we suggest to our authors the publication of a List with reference to descriptions, in a similar manner to Melsheimer's and Morris' Catalogues, so that the student might know where to look for descriptions of the species and genera?

THE INSECT WORLD; being a popular account of the orders of Insects, together with a description of the Habits and Economy of someof the most interestingspecies. From the French of Louis Figuier. Illustrated by 564 wood-cuts, by M M. E. Blanchard, Delahaye, after Reaumur, etc. New York: D. Appleton & Co., 1868. Toronto: Adam & Stevenson. Price $4.50.

The title of this handsome work, which we have given in full, will afford our readers a good idea of its general character. It is a popular and very readable book, profusely illustrated, and as far as we can judge from a limited examination, quite reliable in its statements. It will no doubt be found valuable by beginners in Entomology, though to residents in America it possesses the drawback of referring for the most part to European species of insects, which are not found on this side of the Atlantic.

BOOKS RECEIVED.

Proceedings of the Boston Society of Natural History. Taken from the Society's Records. Vol. xii., June to October, 1868.

The American Entomologist. St. Louis, Mo., October and November, 1868.

The Maine Farmer. Augusta, Me., September 3, 10, 19, 26, October 3, 10, 17.

TO CORRESPONDENTS.

M. S. H., East Liverpool, Ohio.—The *Canadian Naturalist and Geologist* was published by the Natural History Society of Montreal. It commenced in February 1856, since which time eight volumes of the old series, and Vols. i. and ii., with three numbers af Vol. iii. of the new series, have been published. The last number, that for May, 1867, appeared in January last, since which time we regret to say, the publication has been discontinued, but we trust it will soon be resumed.

J. F., who has lately removed from Canada to Detroit, Mich., wishes to know whether there are any Entomologists in his new place of abode. We do not know of any ourselves, but perhaps some of our readers, who may be better acquainted with the locality, will kindly inform us.

G. M. M., Fort Reynolds, Col.—Have sent a specimen number as desired.

B. B., Ottawa; T. R., Montreal.—The cork, we regret to say, has not yet arrived; we shall send you the quantities you desire immediately upon its receipt.

SUBSCRIPTIONS to Vol. i. have been received, with thanks, from the following:—H. L. M., Malden, Mass.; E. L. G., and J. A., Brooklyn, N. Y.; Dr. W. E. M., Grimsby, Ont.; J. A., West Farms, N. Y.; F. G. S. (with addition from S. H. S.,) Boston, Mass. To Vol. i., with the *American Entomologist*, from Dr. R. H. G., Bayfield, Ont., and Rev. L. P., Portneuf, P. Q.

B. B., Ottawa, Ont.—The large Moth, of which you sent us a drawing, is a specimen of *Erebus odora*, Linn. This fine insect has also been taken at Toronto, by Dr. Sangster, who kindly gave us an opportunity of comparing his specimen with your drawing.

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The Canadian Entomologist.

VOL. I. TORONTO, DECEMBER 15, 1868. No. 5.

DESCRIPTIONS OF NEW CANADIAN ICHNEUMONIDÆ.

BY E. T. CRESSON, PHILADELPHIA, PA.

1. BANCHUS FLAVESCENS.—Male. Pale yellow; a bilobed mark behind antennæ, extending between them downward upon middle of face, band across vertex from eye to eye, covering ocelli, posterior margin of occiput, maxillary palpi, two apical joints of labial palpi, antennæ above, stripe on middle of mesothorax, dilated anteriorly, a stripe on each side over the wings, basal suture of scutellum, base of metathorax, broader laterally, spot on each side of pleura posteriorly, posterior coxæ within, their femora beneath, apex of their tibiæ, and a broad band at base of four basal segments of abdomen, black; antennæ longer than body, slender at tips; scutellum with an acute dusky spine; wings hyaline, faintly yellowish, nervures brown, stigma and costa pale honey-yellow; posterior coxæ and femora stained with ferruginous; abdomen shining, short, apex broad, truncate and compressed. Length five lines.

Hab.—Ottawa, C. W. (Mr. Billings.) Coll. Am. Ent. Soc.

2. BANCHUS BOREALIS.—Male. Pale ferruginous, shining; orbits, clypeus, mandibles, palpi, and four anterior legs yellowish: stripe down middle of face, spot beneath eyes, two spots behind antennæ, band across vertex from eye to eye, covering ocelli, posterior margin of occiput, three broad stripes, sometimes only one, on mesothorax, basal sutures of scutellum and metathorax, spot on pleura beneath, posterior coxæ within and at base beneath, line on posterior femora beneath, and a sub-basal fascia, sometimes irregular, on second and following segments of abdomen above, becoming less distinct on apical segments, black; sometimes the pleura is black with a large ferruginous spot on each side; posterior tibiæ dusky at apex; wings yellowish-hyaline, subviolaceous, slightly dusky at apex, nervures brown, stigma and costa honey-yellow; antennæ brown above; scutellum with an acute spine; metathorax rugulose, posterior angles prominent; abdomen smooth and shining, first segment with prominent stigmatic tubercles. Length 5½ lines.

Hab.—Ottawa (Billings); London (Saunders). Coll. Am. Ent. Soc.

3. BANCHUS CANADENSIS.—Male and female. Ferruginous, dark on head and thorax; face except central stripe, front except two black spots behind antennae, broad posterior orbits, line on collar, two lines on mesothorax dilated anteriorly, tegulae, line beneath, scutellum, spot on postscutellum, transverse subangular band on metathorax, spot on each side, elongate spot on pleura, four anterior coxae beneath, trochanters, spot on posterior coxae behind, four anterior femora in front, their tibiae and tarsi, basal half of posterior tibiae, base of their tarsi, and apical margin of abdominal segments, broadest on second and third, yellow; antennae blackish, pale at base beneath; central dark stripe of mesothorax, sometimes black; scutellum with a short acute tubercle in male, scarcely visible in female; wings yellowish-hyaline, nervures brown, stigma and costa pale honey-yellow; tips of posterior tibiae sometimes blackish; abdomen polished, compressed at apex, which is truncate in male, pointed in female. Length 4½-5 lines.

Hab.—Ottawa (Billings); London (Saunders). Coll. Am. Ent. Soc.

4. AROTES AMOENUS.—Female. Black, shining; face, orbits, broad behind, mouth, broad annulus on antennae, large mark on each side of prothorax, margins of mesothoracic lobes, tegulae, spot beneath, scutellum, large trilobed mark at tip of metathorax, a round spot on the flanks, large mark on each side of pleura, indented with black anteriorly, four anterior legs, spot on posterior coxae above and beneath, their trochanters, tips of their femora, basal third or half of their tibiae, their tarsi except claws, and a narrow apical fascia on all the abdominal segments, pale yellow or yellowish-white; wings hyaline, the extreme apex fuscous, nervures black, second recurrent nervure not uniting with the transverse cubital nervure; four anterior femora black behind; first abdominal segment with a prominent sub-basal tooth beneath; venter yellowish, the long acute ventral valve blackish; ovipositor longer than body, rufous, sheaths black. Length 6½-7½ lines. Male of a brighter yellow; antennae longer than body, yellow, only its basal half above, black; posterior coxae yellow with a black line above and within, their femora black above, except tips, sometimes only the extreme base of their tibiae are yellowish; the abdominal fasciae are broader, and the basal segment has a central yellow stripe more or less abbreviated behind, and sometimes reduced to a sub-basal spot. Length 5½-6½ lines.

Hab.—London (Saunders); Grimsby (Pettit). Coll. Am. Ent. Soc. This is a handsome and conspicuous species.

5. AROTES FORMOSUS.—Male. Differs from *amoenus* by the yellowish markings being much paler and less developed; the antennae are black at extreme apex both above and beneath, the sides of the thorax are almost entirely black; the superior wings have a fuscous spot at extreme tip, and the

second recurrent nervure unites with the transverse cubital nervure, by which character it may be readily distinguished from *amoenus*. Length 5½ lines.

Hab.—Ottawa (Billings). Coll. Am. Ent. Soc.

6. COLEOCENTRUS PETTITI.—Female. Black, somewhat shining; wings yellowish-hyaline, nervures black, honey-yellow at base, areolet small, triangular, petiolated; legs honey-yellow, coxae and posterior tibiae black, posterior tarsi yellow, dusky at base; abdomen broad at apex, which is compressed and shining; ovipositor as long as body. Length 6½ lines.

Hab.—Grimsby, C. W. (Pettit). Coll. Am. Ent. Soc. In this genus the last ventral segment is long and lanceolate, as in *Arotes*, but which has the areolet of anterior wings wanting.

This fine species is respectfully dedicated to Johnson Pettit, Esq., of Grimsby, to whom I am indebted for many specimens of Canadian Hymenoptera.

7. RHYSSA CANADENSIS.—Female. Black, shining; anterior orbits, interrupted on each side of antennae, palpi and tegulae white; antennae brownish at tip and beneath; mesothorax coarsely transversely rugose; metathorax with a broad, deep, longitudinal channel on the disk; wings hyaline, faintly stained with yellowish, nervures black, pale at base, as well as extreme base of stigma, areolet minute, petiolated, sometimes reduced to a mere point; legs bright honey-yellow, tips of all the tarsi, extreme tips of posterior femora, and base and apex of their tibiae, fuscous, middle of tibiae pale; abdomen long, minutely transversely aciculate; ovipositor longer than body, piceous, sheaths black. Length 7-8 lines.

Hab.—Quebec (Couper). Coll. Am. Ent. Soc. Mr. Couper informs me that this insect was found "boring into a pine tree."

8. EPHIALTES MACER.—Female. Slender, black, shining, with short, thin, glittering, cinereous pile; cheeks and sides of thorax polished; clypeus reddish; palpi whitish; metathorax with a shallow central channel; tegulae, and sometimes a short line in front, whitish; wings hyaline, beautifully iridescent, nervures brown, areolet triangular; legs honey-yellow, front coxae, except dusky spot in front, their trochanters, and apex of four posterior trochanters, whitish; tips of posterior femora, their tibiae and tarsi more or less dusky, the tibiae more or less pale at middle and within, and sometimes the middle tibiae and tarsi are varied with dusky, the posterior coxae in one specimen are dusky behind; abdomen long, cylindrical, surface uneven, densely punctured and somewhat shining, subpubescent, posterior margin of the segments unevenly transversely wrinkled, first segment shorter than second, the second to fifth one-third longer than wide; ovipositor twice, sometimes nearly four times longer than body, very slender, rufous, sheaths

black. Length 4-5 lines; with ovipositor 11-19 lines. Male has antennae brown, pale beneath; legs paler than in female, the anterior coxae and trochanters white, posterior legs more or less obfuscated, base of their tibiae and of their tarsi white; abdomen with first segment about as long as second, with two longitudinal ridges, most prominent at base. Length 2½-3 lines.

Hab.—Ottawa (Billings); London (Saunders). Coll. Am. Ent. Soc. This is the smallest and most slender of our North American species.

9 PERITHOUS PLEURALIS.—Female. Black, shining; anterior orbits, basal margin of clypeus, mandibles, palpi, scape beneath, tip of scutellum, spot beneath posterior wing, arched line on tip of metathorax, four anterior coxae, all the trochanters, anterior legs in front, and posterior margin of abdominal segments, interrupted laterally by a dusky spot, white; scutellum, pleura, sometimes the anterior portion of mesothorax, tibiae, and posterior coxae, honey-yellow; antennae brownish; wings hyaline, iridescent, nervures brown, pale at base, as well as a spot at base of stigma; tibiae and tarsi whitish, tips of posterior femora, a line on outside of all the tibiae, encircling the apex of posterior pair, and tips of tarsal joints, blackish; segments of abdomen shining, with a lateral blister-like elevation on each, two basal segments with thick coarse punctures, remainder with sparse punctures; ovipositor longer than body. Length 4½-6½ lines.

Hab.—Grimsby, C. W. (Pettit). Coll. Am. Ent. Soc. Closely resembles the European *P. mediator*, but differs in the ornamentation of the legs.

10. ARENETRA CANADENSIS.—Male. Deep black, densely and coarsely punctured; head, thorax and base of legs, thickly clothed with short black pubescence, most dense on the head; antennae long, slender; wings hyaline, nervures black, areolet small, triangular, subpetiolate; apex of femora, the tibiae and tarsi dull testaceous, posterior pair pale fuscous; abdomen narrow, subdepressed, shining at tip, apical margin of third and following segments with a very narrow pale fascia. Length 5 lines.

Hab.—London, C. W. (Saunders). Coll. Am. Ent. Soc. Very closely allied to *A. nigrita*, Walsh, which has the pubescence less dense, and whitish.

11. LISSONOTA RUFIPES.—Female. Black, somewhat shining; legs rufous, the coxae, trochanters, and posterior tibiae and tarsi black; middle tibiae and tarsi sometimes dusky; wings dusky hyaline, iridescent, nervures black, areolet small, petiolated; abdomen shining at tip; ovipositor longer than body; body densely punctured, most sparse on abdomen. Length 4½ lines.

Hab.—Grimsby, C. W. (Pettit). Coll. Am. Ent. Soc.

12. LISSONOTA FRIGIDA.—Female. Black; head and thorax densely punctured, opaque; abdomen shining, delicately punctured, polished at apex; wings dusky hyaline, iridescent, areolet triangular, not petiolated; legs, includ-

ing coxae, and abdomen except base of first and the two or three apical segments, rufo-ferruginous; four posterior trochanters and posterior tibiae and tarsi fuscous; ovipositor as long as body. Length 3½ lines.

Hab.—Ottawa (Billings); London (Saunders). Coll. Am. Ent. Soc.

13. LISSONOTA BRUNNEA.—Female. Entirely brownish ferruginous, sub-opaque, four anterior legs paler; body covered with dense punctures; anterior orbits, mouth and tegulae, yellowish; wings yellowish-hyaline, nervures black, areolet small, petiolated; ovipositor as long as body, rufopiceous. Length 5-5½ lines.

Hab.—Ottawa, C. W. (Billings). Coll. Am. Ent. Soc.

14. XORIDES VITTIFRONS.—Female. Black, shining; anterior orbits, face except upper margin, spot on base of mandibles, palpi, line on collar, lateral margin of mesothorax, spot on scutellum, another on post-scutellum, tegulae, and narrow fascia on apical margin of each segment of abdomen, abbreviated laterally on basal segments, white; wings hyaline, nervures black; legs, including coxae, boney-yellow; anterior pair and spot on base of posterior coxae above, yellowish; apex of posterior femora, their tibiae and the four posterior tarsi, fuscous; mesothorax transversely rugose, middle lobe very prominent; metathorax rugulose, sub-pubescent; ovipositor as long as body, slender, reddish, sheaths black. Length 9 lines.

Hab.—London, C. W. (Saunders). Coll. Am. Ent. Soc. The white spot on the face is more or less indented with black above, and sometimes completely divided longitudinally by a black line; the posterior legs, except coxae, are sometimes more or less obfuscated, with the extreme base of their tibiae pale.

15. ECHTHRUS NIGER.—Female. Deep black, sub-opaque, mesothorax shining; tip of labrum, annulus on antennae, tegulae, and the dilated anterior tibiae in front, white; legs tinged with piceous; wings hyaline, faintly dusky at tips, nervures black; metathorax rugose, elevated on the disk; ovipositor longer than body, reddish, sheaths black, whitish at tip within. Length 7½ lines. Male.—Smaller and very slender, shining; antennae entirely black, nearly as long as the body; lateral margin of face, tip of labrum, spot on clypeus, spot beneath eyes, tegulae, tips of anterior femora, and a line on outside of all the tibiae, white. Length 6 lines.

Hab.—Ottawa, C. W. (Billings). Coll. Am. Ent. Soc. Very closely allied to the European *E. reluctator*, but readily distinguished by the white tegulae.

16. ECTHRUS ABDOMINALIS.—Female. Black, sub-opaque; antennae with a broad whitish annulus; wings hyaline, tinged with yellowish, nervures black, stigma reddish; palpi, legs and abdomen, rufous; tegulae reddish; ovipositor

as long as the body, reddish; metathorax as in the preceding species. Length 6 lines. Male.—Much slenderer than female, with lateral margin of face, scape of antennae beneath, and tegulae, pale; antennae entirely black; posterior tibiae dusky, their tarsi pale; abdomen petiolated, long, thickened toward apex. Length 5½ lines.

Hab.—Ottawa, C. W. (Billings). Coll. Am. Ent. Soc.

LUMINOUS LARVÆ.

We have received the following note from Baron Osten Sacken, of New York, on the subject of our larva: —

"A luminous larva is mentioned in your No. 4, p. 30. Is it not the larva of *Melanactes*, described and figured by me in the Pro. Ent. Society, Phil. 1862, p. 125, Tab. i. fig. 8, under the name of 'Unknown larvae?'

"At that time I was uncertain about the genus of the larvae, as well as about the fact of their being luminous. But in a notice which was published in the same proceedings subsequently I communicate the fact, that I found the same larva alive, that it *is* luminous, and that it probably belongs to the genus *Melanactes*.

"The latter article I cannot refer to now, as I have not the book at hand. But it may be found in the Proc. Ent. Soc. Phil., in one of the years after 1862, in the form of a letter read at one of the meetings of the Society.

"R. Osten Sacken"

The notice referred to we have found in the Pro. Ent. Soc. Phil., Vol. iv. No. 2, in the minutes of a meeting of the Society held on April 10, 1865 (p. 8). The Baron, after referring to his paper and figure in 1862, states that, "Last September Mr. J. Carson Brevoort was fortunate enough to find one of the large larvae near West Point, N. Y., under a stone. The specimen is *three inches long*, and belongs to the same species as that which I had figured. In the dark, *this larva emits a soft green light*, shining principally through the sides of the body and the venter; on the back it appears only in the intervals between the horny segments. The whole length of the larva being thus illuminated in the dark, when it moves briskly about, it is a most beautiful object. The larva is still alive, although I have little hopes that it will undergo its transformation in captivity. But I have not the slightest doubt now that it belongs to *Melanactes*, the more so as this genus, in Dr. LeConte's arrangement, is placed in the same subtribe *(Corymbitini)* with *Pyrophorus*. At the time when I first described this larva, all the large specimens which I possessed came from the South (Arizona, New Mexico, Louisiana), and I was not aware that such specimens could be found in the Middle States, and as the largest *Melanactes* occurs in the latter States, this made me doubt that the larva could belong to that genus. The discovery of

the larva in the State of New York removes this doubt. Since it is settled that the larva is an elaterideous one, its structure only gains in interest. As I have shown in my paper, it has more the character of the *Lampyridae* than of the *Elateridae*, and, remarkably enough, it has very little resemblance to the larva of *Pyrophorus*. The latter reproduces the common type of the *Elateridae*, and is very like the larva of *Alaus*."

Our larva, of which we gave a description in No. 1, p. 2 (this description had probably not come under the notice of Baron Osten Sacken when he wrote to us), corresponds very closely in structure and luminosity to the *Melanactes* larva above referred to, and, we now believe, is a species of that genus. It chiefly differs from that described by Baron Osten Sacken in size, being only 1.50 in. in length, coloration, and in being less convex above. The friend who brought me the specimen states that he had frequently seen these "glow-worms" before on his farm, so I trust some more will turn up next year, and that I may have the good fortune to rear a specimen.

The larval exuvia sent us by Mr. Couper (*vide* No. 4, p. 29), is believed by Dr. LeConte to belong to *Photinus borealis*, Randall; its luminosity has not yet been ascertained.

On the 3rd of September, 1868, in the damp misty evening, we captured in a wooded valley close to a little stream, a larva whose anal segments were brilliantly and steadily luminous; a few weeks later we received a similar larva from Mr. James Angus, of West Farms, N. Y., which he found in a path on the night of the 15th of October, being attracted to it by its light; a few days after he found another of the same species under a stone, which also emitted light when kept till evening. These specimens have been determined by Dr. LeConte to belong to the common *Photuris pennsylvanica*, DeGeer; the larva and beetle are figured in the October number of the *American Naturalist*, p. 432.

We are very much obliged to our correspondents for the kind assistance they have given us in the investigation of this, to us, interesting subject.—Ed. C. E.

LONDON BRANCH, ENTOMOLOGICAL SOCIETY, CANADA.

MONTHLY MEETING.

The regular monthly meeting of this Branch of the Society was held on Friday, October 20th, at 8 o'clock, p. m., at the residence of Mr. Charles Chapman. Six members were present. The minutes having been read and signed, the Rev. R. H. Starr was duly elected a member.

Messrs. Saunders and Reed were appointed a committee to confer with the Church of England Young Men's Association, as to giving an Entomological Entertainment under the auspices of the Association.

The members expressed the great pleasure it gave them to welcome back to London their esteemed friend and former President, the Rev. G. M Innes, who has been in Quebec for the last four years.

Mr. Saunders exhibited specimens of the Tree Cricket, *Oecanthus niveus*, with examples of their destructive work on raspberry canes, and the young wood of plum trees; this insect deposits its large eggs in a row in the centre of the twig or cane, and thus weakens it so as to cause it to break off from the weight of foliage in early spring.

A copy of the first two parts of Mr. Edwards' excellent work on the Butterflies of North America was also on the table, the plates of which were much admired.

A MUSICAL LARVA.

BY E. B. REED, LONDON, ONTARIO.

On September 10, 1868, during one of our regular Monday morning excursions, I captured on a beech tree, a short distance from London, a larva which I judged to belong to the *Smerinthian* genus. Its chief peculiarity, to which I wish to call attention, was its power of emitting a singing noise when handled or disturbed. The noise was similar to that produced by that pretty little beetle so common in our gardens, *Lema trilineata*. This is the only instance of a musical larva that I have met with, nor do I remember to have ever seen any mention in entomological books of a similar case. I should be glad to know, Mr. Editor, if you, or any of your correspondents, have ever noticed this musical power in any larva? or if you can explain the manner in which the noise is produced. My specimen was full grown, and in a couple of days duly passed into the pupa stage under the earth in a flower-pot, which I duly deposited in my winter box that I keep buried in my garden, but to my great disappointment it shared the fate of most of the *Smerinthian* larvae I have ever attempted to rear, and although it survived the winter, it failed to reach maturity. I subjoin a description of this larva, as possibly some of your correspondents may recognise it.

Length 1½ inches. Body tapering anteriorly.

Head large, triangular; of a deep shining green color, with lateral yellow stripes, a reddish spot at the apex; a paler green and granulated on the back of the head behind the stripes. Mandibles black.

Body apple-green, thickly covered with small greenish-yellow granulations; the anterior segments semi-transparent; on each side seven faint greenish-yellow oblique stripes edged anteriorly with large granulations, the central stripes having a reddish tinge, the last stripe wider than the rest and terminating at the base of the caudal horn; the latter at an angle of 20°, recurved backwards, purplish red and thickly granulated; the anal plate with

a central elongated black patch with a larger granulation on each side. Stigmata small, round, and dull red.

Under surface slightly paler than the upper, with a darker central line.

Feet pale green, spotted with red; prolegs greenish, semi-transparent.

NOTE BY ED. C. E.—This description corresponds very nearly to that of the larva of *Smerinthus excæcatus*, by Mr. Lintner (Pro. E. S. Phil. iii., p. 665). We have never ourselves met with any Lepidopterous larva that emitted sounds; the imago of *Sesia thysbe* is described by Dr. Gibb (Can. Nat. and Geol. 1859, p. 122) as giving forth a loud and most striking note, "something like the squeaking of a mouse or a bat," which he attributes to the action of the respiratory organs. The well-known European Death's-head moth *(Acherontia atropos)* emits a somewhat similar noise, even before leaving the pupa case, as well as afterwards; Kirby & Spence state further (letter xxiv.), that "its *caterpillar*, if disturbed at all, draws back rapidly, making at the same time a rather loud noise, which has been compared to the crack of an electric spark."

MISCELLANEOUS NOTES.

DOUBLE BROODS.—If others take as much pleasure in reading your little Journal as I do, possibly my mite of information may be acceptable. Mr. W. Saunders has asked a question, in the concluding part of his paper, No 2, for November, although I cannot give an answer, yet I believe I can throw a little light upon the subject. In the summer of 1865 I fed upon the potato the larva of *Macrosila celeus*, G. & R. *(Sphinx 5-maculata)*, which came out of the chrysalis in August. I then made record of the fact which to our entomologists was new. The following year I also raised upon the potato *Macrosila carolina*, Clems., a pair of which came out in September. The same year I also raised from larva *Hemileuca maia*, Walk. (*Saturnia maia*, Harr.), part of the brood coming out in October, and one deformed specimen in the following May. Miss. C. Guild, of Walpole, Mass., a close and careful observer and a reliable naturalist, informs me that her experience with the last named species is, that of the same brood of larvae all going into the chrysalis nearly at the same time, part come out in October and others not until the following October, some lying in the chrysalis one year longer than others. I have been puzzled to account for their seeming irregularities, but as instances of the fact increase, conclude it is a provision of nature that our lack of knowledge only makes it strange. In Mr. B. Billings' article in the same number of your paper he enquires if *Melitæa phaeton* may not be double brooded. Mr. Scudder, in his list of butterflies of New England, says, "I have taken the caterpillar just ready to change, upon the barberry

in the middle of May; does the larva hibernate?" He also says, "it is very rare in Mass." (1863). I with many others had been in anxious search for this beautiful butterfly up to 1866 without success, except in the extreme southern part of the State; now all of a sudden in this year (1866) they were found in their special localities, low and swampy meadows, quite plentiful, and have continued still more plentiful (from June 17 to July 8) to the present time. Dr. Harris collected in this vicinity from about 1825, and with a few exceptions never had met with it.

It is possible that in some instances they may be double brooded. but I have never met with it out of its special season.—PHILIP S. SPRAGUE, 141 Broadway, South Boston, Mass.

OCCURRENCE OF DEILEPHILA LINEATA IN ENGLAND.—In the September and October numbers of the *Entomologists' Monthly Magazine* (London, Eng) there are numerous accounts of the capture of this handsome sphinx in various parts of England. Is this the same species as that taken in this country, or is it the European *D. livornica*, the *D. lineata* of Fabricius' later works, and of Stephens?

EXCHANGES.

COLEOPTERA.—I am desirous of exchanging *Coleoptera*, as I am forming a collection of North American *Coleoptera*, and wish to get every species from every part of North America in which it may be found. If you can put me in the way of any Canadian collectors who wish to exchange, I should be very much obliged. I have at present a collection of about 2,000 species, mostly from New England, N. Y., Penn., D. C., and Mich.,—very few Northern or Western species, and am desirous of making arrangements to get such.—E. P. AUSTIN, Cambridge, Mass.

HYMENOPTERA.—Mr. E. T. Cresson, of Philadelphia—whose valuable paper, containing original, hitherto unpublished descriptions, of new Canadian species of this order, we print on a previous page—begs to inform the Entomologists of Canada that he will be glad to determine specimens of Canadian *Hymenoptera* for any one who will send a duplicate set, duly numbered to correspond with their cabinet specimens, to the care of JOHNSON PETTIT, Esq, Grimsby, Ont., who will forward them to him. He will describe all the new species thus received in the *Canadian Entomologist*. There is a peculiar fauna in this country of which he would like to get a good collection so as to make the species known to science.

We trust that all our Canadian readers will send on what undetermined *Hymenoptera* they have, and make a point of collecting diligently in this interesting order next year.—ED. C. E.

NEW ENTOMOLOGICAL WORKS.

THE BUTTERFLIES OF NORTH AMERICA; with colored drawings and descriptions. By Wm. H. Edwards. Philadelphia: The American Entomological Society. Part 2, August, 1868. Price $2.

The second part of this magnificent work, to which we have already drawn attention, is now before us. It contains five beautifully colored plates, and descriptive letter press; the species figured (none of which are Canadian) are *Argynnis callippe*, Boisd., taken in California; *A. hesperis*, Edw., from Colorado; *Colias Alexandra*, Edw., from Empire City, Colorado, "high up in the mountains, near the Snowy Range;' *C. Helena*, Edw., from Mackenzie's River; *C. Christina*, Edw., from Slave River; *C. Behrii*, Edw., from among the Yo Semite Mountains, California, at an elevation of about 10,000 feet above the sea; *Apatura Alicia*, Edw. (new species), from New Orleans.

BOOKS RECEIVED.

Proceedings of the Boston Society of Natural History. Taken from the Society's Records. Vol. xii., Oct. 7 and Nov. 4, 1868.

The Maine Farmer. Augusta, Me., Nov. 7, 14, 1868.

From Prof. Townend Glover, Washington, D. C., a series of his admirably executed plates on the cotton plant and the insects injuring it, and on *Diptera*, &c., in all forty-three plates. A valuable addition to the, at present, small library of the Society; and for which we beg the author to accept our best thanks.

TO CORRESPONDENTS.

REV. L. P., Port Neuf, P. Q.—The following are all of your Coleoptera that we are able to determine as yet; we shall endeavour to have the rest named for you shortly. (3) *Oxytelus sculptus*, Grav. (5) *Hylastes pinifex*, Fitch. (6) *Hylastes?* (7) *Dinoderus substriatus*, Payk. (9) *Tacyporus jocosus*, Say. (10) *Dibolia aerea*, Mels. (11) *Paria 4 notata*, Say. (12) *Haltica?* (14) *Pterostichus lucublandus*, Say. (15) we take to be an *Amara*, not a *Pterostichus*; the species of this genus are very difficult to determine; your specimen differs from all in our cabinet.

V. S. C., Covington, Ky.—Your letter was received after our article on "Luminous Larvæ" was in type. The specimen enclosed which, you say, when taken last June, was luminous, and had power to put out its fire at will, is the larva, we think, of a *Photuris*, but different from any that we have. Your common fire fly is, you state, *Photinus centrata*, Say; it is not taken in Canada, our commonest phosphorescent species being *Photuris pennsylvanica*, DeGeer. Stainton's "Manual," vol. ii. (London, Van Voorst, 1859, price 10s.), contains a synopsis of the genera and species of *British* Micro-Lepidoptera; his "Entomolo-

gist's Companion" (Van Voorst, 3s.), is a manual on the *Tineina*: the most complete work is his "Natural History of the *Tineina*" (Van Voorst, 12s. 6d. each vol.), which is published in annual volumes since 1856. *American* species and genera are described by Dr. Clemens in the Pro. Acad. Nat. Sci. Phil. 1859, pp. 256 and 317; 1860, pp. 4, 161, 203, 345, and 433; and also in the Pro. Ent. Soc. Phil. We do not know of any work on the Micro-Homoptera. We can supply you with the Cork you require, but how shall we send it? The charges by express would be more than double its value for so small a quantity; by Post it would have to go at letter rates, as there is no Parcels Post between the two countries.

SUBSCRIPTIONS to vol. i. have been received from the following:—E P. A., Cambridge, Mass.; H. F. B., Waterbury, Conn.; Miss E. R. C., Amherstburg, Ont. (per Mr. Reed), and Dr. A. S. P., jun., Salem, Mass. (2 copies, for the library of Bowdoin Coll., Brunswick, Me., and the Portland Soc. Nat. History).

LETTERS RECEIVED.—E. T. C, Philad. (3. Many thanks); Prof. T. G., Washington, D. C.; Dr. J. L. LeC., Philada.; S. H. S., Boston, Mass.; Dr. G. H. H., Philada.; B. D. W., Rock Island, Ill.; T. R., Montreal (with P. O. O.); J. A., West Farms, N. Y. (the box has not yet arrived, but we have caused the express agents to make enquiries respecting it).

SHEET CORK.—We have now on hand a large supply of sheet cork, imported from the English manufacturer. Ordinary thickness for cabinets, 16 cents per square foot; extra thick for travelling boxes, 24 cents do. The former can be sent to any place in Canada by parcels post at the rate of 12½ cents per 6 feet; the latter 12½ cents per 3 feet.

THE CANADIAN ENTOMOLOGIST is published on the 15th of each month by the Entomological Society of Canada. In consequence of the new Postal Law, which requires pre-payment of all Periodicals after January 1, 1869, we are constrained to make a slight change in the rates of subscription, as follows:—

To members of the Society, gratis.

To non-members (in Canada) 56 cents per vol., post-paid; two copies to one address $1.

To subscribers in the United States, 62 cents per volume, free of Canada postage. The ordinary U. S. fractional currency may be sent.

To subscribers in Great Britain, 3 shillings per volume, post-paid. The amount may be sent in stamps.

Extra copies 5 cents each, 50 cents per dozen.

The *American Entomologist* ($1) and the *Canadian Entomologist* (56 cents), will be furnished, post paid, for one dollar and twenty-five cents ($1.25) per annum.

N. B.—Correspondence is invited respecting the habits, localities, occurrence, &c., of insects, as this journal is intended to be a medium for the recording of observations made in all parts of the country; insects for identification will be gladly attended to and returned when desired. Any contributions to the publication fund will be thankfully received and gratefully acknowledged.

All communications, remittances and exchanges should be addressed to "THE REV. C. J. S. BETHUNE, Credit, Ont., Canada."

The Canadian Entomologist.

VOL. I. TORONTO, JANUARY 15, 1869. No. 6.

NOTES OF CANADIAN LEPIDOPTERA.

(BY THE EDITOR.)

(Continued from Page 18.)

32. CALLIMORPHA LE CONTEI, Boisd.—In our List as a *Hypercompa*. Grote and Rob., in their valuable "List of Lepidoptera," p. viii, enumerate no less than seven varieties or synonyms of this species, of which *C. Contigua*, Walk., was included in our list. This is certainly a well-marked and constant form, and can hardly, we think, be merged into *Lecontei* until both have been reared from the same larvae. Mr. Saunders (*vide* C. E., No. 3, p. 20) has been the first to rear and describe the larva of any species of this genus.

33. CALLIMORPHA INTERRUPTO-MARGINATA, Beauv.—Formerly known as a *Hypercompa*. What a pity that we cannot substitute Harris' short and appropriate name *Anchora* for the species!

34. PLATARCTIA PARTHENOS, Harris.—This new genus, which includes five species, has been separated by Dr. Packard from *Arctia*; its members are distinguished by having no gay-coloured bands across the fore-wings, but a yellowish band across the hind-wings beyond the middle. *Parthenos* is an extremely rare insect in Canada; we have seen but one specimen, captured by Mr. J. M. Jones, in Nova Scotia. Should any collector be so fortunate as to make a haul of this species at any time, we trust he will remember that both we and many of our correspondents are anxious to obtain specimens.

35. PLATARCTIA BOREALIS, Mosch.—A full description of this insect is given by Dr. Packard (Pro. E. S. Phil. iii. 111). He states, on the authority of Mr. Edwards, that it has been taken at Quebec. Another species, *P. Scudderi*, Pack., we can hardly include as Canadian yet; it was taken by Mr. Scudder, on the Saskatchewan river.

36. EUPREPIA AMERICANA, Harris.—In our List as an *Arctia*.

37. PYRRHARCTIA ISABELLA, Smith.—A new genus, by Dr. Packard, for this old friend (well know as a *Spilosoma*), and a California species.

38. LEUCARCTIA ACRÆA, Drury.—Also separated from *Spilosoma*, by Dr. Packard.

39. HYPHANTRIA TEXTOR, Harris.—A common insect in many parts of Ontario, but not included in our Lists. Its larva is likely to become only too familiar with apple growers (*vide* Canada Farmer, 1867, p. 269.)

40. ORGYIA NOVA, Fitch.—We took this species at Cobourg, in Sept. 1865, flying about a lawn in the sunshine.

41. ICHTHYURA INVERSA, Packard.—Taken at London, Ontario, by Mr. Reed, at Cobourg, Ontario, by ourselves, and in Nova Scotia, by Mr. Jones.

42. ICHTHYURA ALBO-SIGMA, Fitch.—In our List as a *Clostera*. Taken in Toronto and other parts of Canada, and also in Nova Scotia.

43. ICHTHYURA INCLUSA, Hubn.—In our list as *Clostera Americana*, Harris.

44. DATANA CONTRACTA, Walk—Taken by Mr. Reed, at London, and by ourselves at Credit, June 22, 1868, attracted by light.

45. DATANA ANGUSII, Grote & Rob.—Taken by Mr. Pettit, at Grimsby, Ontario. We have to thank Mr. James Angus, of West Farms, N. Y., from whom the species derives its name, for a fine pair of specimens, together with a number of other insects.

46. CŒLODASYS BIGUTTATA, Pack.—Taken at Orillia, Ontario, by Mr. Bush; described by Mr. Walker (C. B. M. xxxii. 417), and in our List, as *Heterocampa ducens* and *H. compta*.

47. HETEROCAMPA MANTEO, Walk.—In our List as *H. subalbicans*, Grote; the former name has the priority.

48. IANASSA LIGNICOLOR, Walk.—Described by Walker afterwards (C. B. M., xxxii, 427) as *Edema? transversata*; the name *Edema plagiata*, Walk., is also to be dropped from our List. According to Grote & Rob. (Trans. Am. Ent. Soc. ii. 86) it belongs to *Parorgyia* Pack.

49. DYROPTERIS ROSEA, Grote.—Taken in Nova Scotia, by Mr. J. M. Jones, President of the Institute of Natural Science, at Halifax.

50. DRYOPTERIS IRRORATA, Packard.—Also taken in Nova Scotia, by Mr. Jones.

51. TELEA POLYPHEMUS, Hubn.—In our List as a *Saturnia*.

52. ACTIAS LUNA, Leach.—Ditto.

53. CALLOSAMIA PROMETHEA, Drury.—Ditto. A new genus by Dr. Packard.

54. PLATYSAMIA CECROPIA, Linn.—Ditto. A new genus by Mr. Grote.

55. PLATYSAMIA COLUMBIA, Smith.—This species, which is described as closely allied to *P. cecropia*, but differing from it in all its stages, is reported to have been taken in the neighbourhood of Quebec; we should like to hear from our friends in that quarter about it. Its food-plant, the *Rhodora Canadensis*, grows plentifully back of Toronto, so we hope to hear of its capture there ere long.

56. HYPERCHIRIA VARIA, Walk.—We have been so long accustomed to call this insect *Saturnia io*, that we find it difficult to recognize it under its proper name. *Io* is the name of a South American insect of a different genus.

57. ANISOTA STIGMA, Smith.—In our List as a *Dryocampa*.

58. ANISOTA SENATORIA, Smith.—Ditto.

59. ANISOTA PELLUCIDA, Smith.—Ditto.

60. TOLYPE VELLEDA, Hubn.—In our List as *Gastropacha*.

61. TOLYPE LARICIS, Fitch.—Ditto.

62. CLISIOCAMPA DISSTRIA, Hubn.—In our List as *C. sylvatica*, Harris; the former name has the priority.

63. XYLEUTES ROBINIÆ, Harris.—In our List as a *Cossus*.

LIST OF DIURNAL LEPIDOPTERA.

OBSERVED IN THE NEIGHBOURHOOD OF OTTAWA, DURING THE SEASON OF 1868.

BY E. BILLINGS.

1. *Papilio turnus*, L.—Not common, a few specimens seen late in June and early in July.

3. *Papilio asterias*, Dr.—Rare. But two specimens seen, one in July, and the other in August.

3. *Pieris oleracea*, Harr.—Plentiful. May, July, August and September.

4. *Colias philodice*, Godt.—Abundant throughout the season, except in July. The variety of white females was occasionally met with in August.

5. *Danais archippus*, Harr.—Very common from the last of July to 1st October. A few worn individuals seen about the 1st July. Does this species immigrate? Otherwise what becomes of it for nine months of the year?

6. *Limenitis disippus*, Godt.—June, rare. July to October very common. From the larva, I obtained a butterfly which remained but five days in the chrysalis state.

7. *Limenitis arthemis*, Dr.—Plentiful in woods. July and August.

8. *Argynnis cybele*, Godt.—July, August and September. Not common.

9. *Argynnis atlantis*, Edw.—Appears to be rare. But two specimens observed.

10. *Argynnis myrina*, Cram.—Very abundant in June, and plentiful in August and September.

11. *Melitæa tharos*, Cram.—Common. July, August and September.

12. *Melitæa phaeton*, Cram.—Dow's swamp, two miles from city limits. Quite plentiful early part of July.

13. *Vanessa J-album*, Bdvl. & Lec.—Rare. But one specimen seen, in August.

14. *Vanessa Milberti*, Gdt.—Very common from May to October, excepting during the month of June. About the 20th June, I collected 60 of the larvæ, which I confined in a single cell in the breeding cage. They refused to take food, and commenced to suspend themselves from the ceiling. Within two days every individual had passed into the pupal state, in which they remained but four days, at the end of which time I found 60 butterflies—not one, it appears, had failed to come to maturity.

15. *Vanessa antiopa*, L.—Rare. A single specimen seen in June, and several in October.

16. *Grapta progne*, Harr.—Rather rare, occasionally met with in open woods throughout the season, from May to October.

17. *Grapta faunus*, Edw.—Rare. But one specimen observed, in woods late in July.

18. *Neonympha eurythris*, F.—Common in open woods in July.

19. *Hipparchia Boisduvalii*, Harr.—Moist places; quite plentiful; July.

20. *Erebia nephele*, Kirby.—Abundant in fields and thickets in July and August.

21. *Chrysophanus Americana*, D'Urban.—Plentiful in June, and from the latter part of July to October.

22. *Lycæna neglecta*, Edw.—Rare. But a single specimen seen, in June.

23. *Lycæna lucia*, Westw.—Rather rare. June and July.

24. *Thecla acadica*, Edw.—Rare, on thistle blossoms in July.

25. *Pyrameis atalanta*, L.—Rare. But four specimens seen in August.

26. *Pyrameis cardui*, L.—From 1st of August to October; very common.

27. *Nisoniades brizo*, Bdvl & Lec.—Plentiful in thickets, in June.

28. *Eudamus bathyllus*, Bdvl. & Lec.—Plentiful in June and July.

29. *Hesperia metacomet*, Harr,—Appears to be rare. A few specimens observed in meadows in July.

30. *Hesperia Hobomok*, Harr.- Abundant in June, not afterwards seen. There does not appear to have been a second brood.

31. *Hesperia ahaton*, Harr.—Very abundant the latter part of June and early in July. The only indication of a second brood was a single individual seen by me on 3rd September.

32. *Hesperia wamsutta*, Harr.—Abundant in July and occasionally met with in August.

33. *Hesperia mystic*, Scudd.—June, July and August; in meadows; rare.

34. *Hesperia Leonardus*, Harr.—But a single specimen, seen in a meadow in July.

35. *Hesperia Pocahontas*, Scudd.—Rare; in thickets; June and July.

Besides the above, I have taken previous to the present season :

36. *Grapta comma*, Dbld.—Which I raised from larvæ found on the hop.
37. *Pyrameis huntera*, Sm.—Quite common in 1863.
38. *Thecla falacer*, Godt.—Taken on composite flowers in August.
39. *Nisoniades catullus*, Sm.—Taken within the government grounds at New Edinburgh.

MISCELLANEOUS NOTES.

Musical Larvæ.—Noticing Mr. Reed's communication in your issue of Dec. 15, 1868, I thought it might be interesting to note that about twenty similar larvæ were found by me last autumn, on the hickory. Unfortunately, they died before reaching the pupa state. The noise seemed to be produced by contracting the anterior segments, thus rubbing the granulations against each other. Another sphinx larva, which I cannot now identify, emitted a sound resembling that attributed by Kirby & Spence to the larva of *A. atropos*, on being disturbed. This seemed to be caused by quickly opening and shutting the mandibles.—Theodore L. Mead, New York.

Winter Collecting.—As an inducement to others to try winter collecting, I would mention that I have taken lately, in addition to many common forms, specimens of *Plochionus timidus*, Hald., *Lymexylon sericeum*, Harris (dead), *Merinus lævis*, *Xylophilus piceus*, Lec., and others, with several species of Hemiptera, Hymenoptera, &c.

I am now making out a list of my species, and think I shall be able to add nearly 300 to our list of Canadian Coleoptera.—J. Pettit, Grimsby, Ont.

Last Moth of the Season.—On the 29th of Nov., 1868, I captured under a tree a live specimen of *Xanthia ferrugineoides*, Guen.; the thermometer was then at the freezing point, and it snowed the whole of the rest of the day. I had seen several specimens of the same moth flying about on various occasions during October and November. In Sept., 1865, I took numbers of this species at Cobourg, about plum trees, on the fruit and flying, both in the day time and at night; it was accompanied by great numbers of *Anomis grandipuncta*, Guen., and several specimens of *Xylina Bethunei*, Grote & Rob. All three species appeared to have a high appreciation of our finer varieties of plums, of which we had a very large crop that year.—C. J. S. B.

Depraved Taste of a Sphinx.—About mid-day on the 23rd of June, 1868, a very hot day, I was driving through a wood in the township of Trafalgar, when my nostrils were greeted with a horrid odour arising from the carcase of a little dog, floating in a filthy pool, the last remnant of a dried-up stream. The place was perfectly swarming with flies, and to my utter aston-

ishment I beheld, perched on the top of the carcase in the midst of the flies, a beautiful specimen of that most lovely moth, *Amphion nessus*, Cram. Having no net with me, I tried in vain to capture it, and, though repeatedly disturbed, it returned again and again to its horrid repast. I have often seen specimens of *Danais archippus* and other butterflies swarm about dead fish on the shores of Lake Simcoe, but I hardly expected to find so lovely a moth in such a position, in the full noon-tide heat and glare of the day; I have usually taken it hovering over the fragrant blossoms of the lilac, in the cool twilight of the evening.—C. J. S. B.

Musical Larvæ.—No. 5 of your valuable little Journal, full of interesting matter as usual, is before me. In regard to musical larvæ of Lepidoptera, I am happy to communicate a fact from my own observations on the larva of *Cressonia juglandis*, Grote *(Smerinthus juglandis* of Smith, Harris, *et auct. al.)* We find this species in the month of September, often into October, upon the "hickories" *Carya alba* and *porcina*. When the tree is struck or jarred, any larvæ that may be upon the leaves give utterance to a note resembling the sound *tcêp* or *tceep*, produced by the inspiration of a small quantity of air between the upper teeth of the human mouth and the lower lip, as in the act of sucking. As this larva clings quite firmly to its foothold, the jar may be often repeated, each time with the same result, before the insect is dislodged. On being seized between the thumb and finger a little behind the middle, it flexes the body sharply from side to side, with a simultaneous emission of the sound alluded to. While writing the above, my valued friend, Mr. Philip S. Sprague, of this city, has recalled the fact of a similar sound being produced by the larvæ of *Smerinthus excæcatus*, Smith, and *geminatus*, Say, when irritated, in the breeding cage. Mr. S. has, in his own mind, attributed this sound to the motion of the mandibles upon each other (quasi "gnashing of teeth?"). I presume similar occurrences have been noticed by other observers, and no doubt more thorough acquaintance with many of our so-called "dumb animals" will prove that "There is no speech nor language where their voice is not heard."—F. G. Sanborn, Boston, Mass.

NEW ENTOMOLOGICAL WORKS.

A Guide to the Study of Insects, and a Treatise on those Injurious and Beneficial to Crops. For the use of Colleges, Farm Schools, and Agriculturists. By A. S. Packard, jun., M. D., Salem, President of the Essex Institute. Parts 3 & 4, 1868. Price 50 cents each.

Two more parts of this most valuable and interesting work are now before us. Part 3 is entirely devoted to the order Hymenoptera, and contains

accounts of the habits and economy of the various species of bees, wasps, hornets, ants, &c.; it is illustrated with three excellent full-page plates, and nearly fifty accurate wood cuts. Part 4 concludes the Hymenoptera, taking up the families of Ichneumons and other parasites, gall flies, saw flies, and horn tails; the remainder of the Part is occupied with the commencement of the order Lepidoptera, and describes the general structure of its members, the mode of rearing and preserving larvæ, and the beginning of an account of the family *Papilionidæ*. In the last few pages we observed descriptions of two new species by our friend and coadjutor, Mr. W. Saunders, viz.: *Papilio brevicauda*, from St. John's, Newfoundland, and *Melitæa Packardii*, taken, we believe, in this country. This part is illustrated with upwards of sixty wood-cuts. Need we again commend this invaluable work to the attention and support of our readers?

THE AMERICAN ENTOMOLOGIST. Edited by B. D. Walsh and C. V. Riley. Published monthly by R. P. Studley & Co., 104 Olive Street, St. Louis, Mo. Oct., Nov. and Dec., 1868, Jan., 1869.

Since our former notice of this excellent periodical, four more numbers have appeared, each one replete with interesting matter, and remarkably well illustrated with Mr. Riley's carefully-executed wood-cuts. We were much gratified at learning from the November number that its circulation was then "5,000 per month, and increasing at the rate of 15 to 50 daily." This is as it should be; and we hope to hear that it has attained to the number of 10,000 before the close of the volume. We may mention again that we shall be happy to supply subscribers in Canada with copies, free of both American and Canadian postage, on the receipt of one dollar; or, together with our own publication, post free for $1.25. We shall willingly furnish specimen numbers on application.

BOOKS RECEIVED.

Proceedings of the Boston Society of Natural History. Vol. XII., Nov. 18, 25, Dec. 2, 1868. Besides much other interesting matter, we find in these *Proceedings* a description of a new species of *Thecla*, taken at Milford, N. H.; a method of preserving larvæ in carbolic acid; and descriptions of new species of North American Bees, by Mr. Cresson, including one from Canada. We are much obliged to the Society for the kind exchange, the advantage of which is almost all on our side.

The Maine Farmer. Augusta, Me. Nov. 21, 28, Dec. 5, 12, 19, 1868. An excellent agricultural and family paper.

Prospectus of *Le Naturaliste Canadien;* a projected monthly periodical, on all branches of natural history, to be published at Quebec (in French) by

M. C. Darveau, and edited by our respected correspondent, M. l'Abbe Provancher, of Portneuf. The subscription price is $2 per annum, payable in advance. We heartily wish success to this first attempt to popularize natural history among the French speaking inhabitants of Lower Canada.

The American Naturalist. Salem, Mass. Vol. II., No. 11, Jan., 1859. We always look forward eagerly to the arrival of each number of this most interesting magazine. If any one with any taste for natural history wishes to spend a pleasant hour by the cozy fireside in winter, or enjoy the cool shade of a wide-spreading tree in summer, or indeed occupy his leisure time profitably and agreeably all the year round, we commend him to this periodical. Every number contains something about Entomology; this time there is a capital "Chapter on Flies," by Dr. Packard, illustrated with a full-page plate and several wood cuts. A new volume begins with the March number, when the editors find themselves compelled to increase the subscription price. It has always been a marvel to us how they provided such illustrations and such paper, to say nothing of the reading matter, at so low a rate. Up to March 1, the terms for Vol. III. will be $3.50 (U. S. currency), *after that date* $4. We will furnish it to our subscribers, post paid, for $3 (Canadian currency) per annum; or the *Canadian Entomologist* and *American Naturalist* for $3.25 per annum to new subscribers.

The Canadian Journal of Science, Literature and History, Vol. XII., No. 1, Dec., 1868. Toronto: printed for the Canadian Institute.

EXCHANGE.

British Lepidoptera.—I shall be very happy to exchange British *Lepidoptera* for American *Lepidoptera*, or insects of other orders, especially the former. Rev. F. O. Morris, Nunburnholme Rectory, Hayton, York, Eng.

*** Exchanges with European Naturalists are most kindly allowed to be effected, free of charge, by the Smithsonian Institution, Washington, D. C., to which the specimens must be sent securely packed and pre-paid. The English agent of the Institution is Mr. W. Wesley, 81 Fleet Street, London.

DONATION.

Johnson Pettit, Esq., of Grimbsy, Ontario, in forwarding his annual subscription to the Entomological Society of Canado, has kindly added a donation to the publication fund of $2; he has also obtained the names of three persons for nomination as members. We beg to offer him our hearty thanks, and commend his good example to the Members of the Society.

All communications, remittances and exchanges, should be addressed to "The Rev. C. J. S. Bethune, *Credit, Ont., Canada.*

The Canadian Entomologist.

VOL. I. TORONTO, FEBRUARY 15, 1869. No. 7.

ENTOMOLOGICAL NOTES.

PAPER NO. III.

BY W. SAUNDERS, LONDON, ONT.

Several years ago it occurred to me that a knowledge of the earlier stages in the lives of some of our Diurnal Lepidoptera, might possibly be arrived at by obtaining eggs from impregnated females in captivity. My experiments began with the Hesperidæ as offering the greatest probability of success. As many females as could be procured (beaten ones preferred, as the likelihood of their impregnation was greater) were confined in separate boxes, some with glass tops admitting light, others darkened. My success was greater than I had anticipated, but none attended the use of boxes where much light was admitted. Whether the failure in the latter case was really due to the admission of light, I am not prepared to say; the number of glass covered boxes used was not proportionally large nor was their use long continued.

I obtained eggs from *Hesperia wamsutta*, *mystic* and *hobomok*, and thus encouraged, the experiments were gradually extended to all the Diurnal Lepidoptera within reach, resulting in success with *Papilio turnus*, *Colias philodice*, *Argynnis myrina*, *Argynnis bellona*, *Polyommatus epixanthe*, *Polyommatus thoe*, and *Thecla inorata*, G. & R. (*falacer* Boisd. plate). In several instances the eggs were not fertilized, still I regard the results achieved as very encouraging, and feel persuaded that by continued perseverance, all that is wanting to complete the history of our butterflies may in this manner be obtained.

Papilio turnus.—A beaten female was captured in the beginning of July, 1865, and confined in an empty Seidlitz powder box; on the second or third day of captivity it was observed that the insect had deposited two eggs, and was still living; the next morning a third was observed and the butterfly found dead. The eggs were between one twentieth and one twenty-fifth of an inch in diameter, subglobular, flattened at the place of attachment—color dark green, surface smooth, without reticulations, but showing a few small irregularly distributed dots under a magnifying power of forty-five diameters. On

the 20th of July, one of them began to change color, growing darker ; on the 21st it became very dark, and on the morning of the 22nd the young larva was hatched. The second egg was then deepening in color and produced the larva on the 23rd. The remaining egg was unproductive and after a time began to shrivel up.

Appearance of larva fresh from the egg.—Length one tenth of an inch. Head large, bilobed, black. Body black, roughened with small brownish black tubercles—second segment* elevated or thickened and of a dull glossy flesh color, with a prominent fleshy tubercle on each side, a patch of white on seventh and eighth segments, wide anteriorly, pointed behind. A dull flesh colored dorsal streak on fourth and eleventh segments. Twelfth segment with a pair of fleshy tubercles, rather prominent, but not so large as those on second. Both those on second and twelfth have several short whitish hairs proceeding from them. Under surface brownish black, feet and prolegs of the same color.

These larvæ I failed to rear. Having no trees of the wild cherry within a convenient distance, I thought they might be fed with leaves from a cultivated variety, on which specimens taken nearly full grown had been previously fed. It appeared however that the leaves were much tougher than those of the native species, so much so that the infantile jaws of these diminutive larvæ failed to make any impression on them, and before the mistake was discovered and the proper food supplied, they were weakened past recovery and died.

Colias philodice.—A female was captured on the 18th of July and placed in a large sized pill box. The box was examined every day until the 23rd, and up to that date no eggs were deposited. It was not looked into again until the morning of the 26th, when five eggs were observed sticking to the sides of the box, and the parent dead. From the stiffness of the body of the dead insect, I thought that they were probably deposited on the 24th.

† The eggs were about one twenty-third of an inch long, much elongated, tapering at each end, with twelve or fourteen raised longitudinal ribs, with smaller cross lines in the concave spaces between them. The cross lines were not always regular, sometimes so, at other times two or three in a row were placed somewhat diagonally. Color when first deposited, pale lemon yellow, changing in three or four days to a pale red, then gradually to *bright* red, and from that to dark brown, just before the larva made its appearance. Four of the eggs hatched on the 30th and the remaining one on the 31st.

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* In these descriptions the head is regarded as the first segment, making the total number thirteen.

† Some of the descriptions following have already appeared in Dr. Packard's book—"A Guide to the Study of Insects"—but for several reasons it has been thought desirable to publish the whole of the information gained by these experiments in an aggregate form.

Appearance of the larva fresh from the egg.—Length one twelfth of an inch. Head black with a few short whitish hairs, some of them rather thick and fleshy looking. Body dull yellowish brown, with longitudinal rows of hairs, similar to those on the head ; those on the second segment and immediately behind the head, longer than the others. Hairs on body very short, whitish, semi-transparent, thick, some of them more like short tubercles than hairs. The descriptions of larvæ of this age, as well as of the eggs, were all taken under a magnifying power of forty-five diameters.

Appearance when more than half grown.– Length five eighths of an inch. Head dark green, slightly downy with minute hairs. Body of the same color, with the same downy look, occasioned by a great number of thickly set short hairs. The body is also dotted with points of a slightly paler hue. A yellowish white stripe on each side close to under surface. Beneath slightly paler than above, feet and prolegs of the same color.

The full grown larva differs from the foregoing only in size, being about one inch long, and in having an irregular streak of bright red, running through the whitish stripe close to under surface.

My specimens were fed on clover. I have since found this larva feeding on the wild lupin *(Lupinus perennis)* and also on the cultivated pea. It is not unlike a sawfly larva in form and action, feeding on the upper surface of the leaves and twisting its body into a coil when disturbed.

Pupa.—Length seven tenths of an inch, girt with a silken thread across the middle ; greatest diameter about the sixth segment. Head case pointed, with a purplish red line on each side, running to the tip and margined behind with yellow. Body pale green, with a yellowish tinge and a ventral line of a darker shade, formed by a succession of minute yellowish dots—a yellowish stripe along the sides of the five hinder segments. Beneath on the seventh, eighth and ninth segments, is a blackish brown line on each side, deepening in color about the middle of each segment, and a dorsal line of dark green about the same length.

On the eighth day the color of the wings began to show underneath, the pink fringe prominent and the discal dots visible, and on the ninth and tenth days the imago appeared.

Argynnis myrina.—A female specimen, somewhat beaten, was captured on the 20th of June, and confined in a large pill box. One egg was deposited on the 22nd or 23rd, and five more on the 24th, all attached to the sides and bottom of the box. The eggs were pale green, elongated, in shape something like an acorn, base smooth and convex, circumference striated longitudinally, with about fourteen raised striæ, which were linear and smooth, spaces between, about three times wider than the striæ—depressed, concave in the middle, and ribbed by a number of cross lines, fifteen to twenty between each striæ

distinctly indented. The egg was contracted at the apex, the striæ protruding at the tip all around, beyond the body of the egg. The eggs became much darker in color before the larvæ appeared.

The larva hatched in six or seven days, and when fresh from the egg was about one-tenth of an inch long. Head medium sized, black and shining. Body above dark brown with transverse lines of a paler color, especially on the anterior segments; and thickly covered with hair-like spines of a pale brownish color.

Between the first and second moult its length was one-fourth of an inch. Head bilobed, shining, black and hairy. Body above greenish black, the greenish tinge most apparent on second and third segments, with a few small yellowish dots along each side and transverse rows of strongly elevated black tubercles, emitting numerous short, black, hair-like spines. Under surface similar to upper; feet black and shining; prolegs black, tipped with a paler hue.

After the second moult there were two fleshy tubercles on second segment much longer than the others, three or four times their length, and covered throughout with small hair-like spines. The yellowish spots along the sides of body assumed more of an orange tint, and one or two faint longitudinal streaks of the same color appeared along the sides close to under surface. Between the rows of large raised tubercles were many smaller ones, also black, appearing but slightly raised.

August 7th. Appearance of the full-grown larva.—Length, eight-tenths of an inch. Head slightly bilobed, black, shining, covered with short fine black hairs.

Body above dark greyish brown, beautifully spotted and dotted with deep velvety black, second segment with two long fleshy horns, yellowish white at base, black above, covered with minute blackish hair-like spines. The third and fourth segments have each four whitish spines tipped with black, those on sides are placed on the anterior portion of segment, those above about the middle. All the other segments have six whitish spines, excepting the terminal one, which has four. All the spines have fine branches of a black or brownish-black color, and are about one-third the length of the fleshy horns on second segment. A pale line extends along each side from fifth to terminal segments, close to under surface. The under surface is brownish black, darker on anterior segments; feet black and shining; prolegs brown, with a shining band of brownish black on the outside.

The chrysalis is about half an inch long, of a pale grey color, dotted and streaked with black. At the tip, beyond the base of antennæ, are two large conical tubercles. On the thorax also, are several smaller pointed tubercles, and a double row along the abdomen of a similar character, those on the third

abdominal segment being larger than the other. The duration of the pupa stage was ten or eleven days.

Since the imago produced were under the average size, something must be added to the length and diameter of the larva and pupa described.

Argynnis bellona.—The eggs obtained from this species were unimpregnated, and soon shrivelled up. In size and color they were similar to those of *myrina*, but were not examined under a magnifying power.

Polyommatus thoe.—These eggs were deposited by a beaten female about the 6th of July, 1868. The egg is nearly round, a little flattened at the apex, and flattened also at the base. Color greenish white, thickly indented; at the apex is a considerable depression, around which the indentations are small, but increase in size as they approach the base.

Polyommatus epixanthe.—About the 10th of July, 1868, twelve eggs were found attached to the lid of a small pill box, in which two females were confined. The egg is nearly round, slightly flattened at the apex, flattened also at the base. Color milk white, thickly indented, a deep depression at the apex, and around this a number of indentations, which are nearly uniform in size all the way to the base—in this latter respect differing from those of *thoe.*

The eggs of both these species of Polyommatus remain as yet unchanged. There is no appearance of shrinking on any part of their surface; it is possible they may produce the larva in spring.

Thecla inorata G & R. (*Thecla falacer*, Boisd. plate).—About the middle of July, 1868, two eggs were deposited on the sides of a pill box. They were of a pale green color, nearly round, with convex apex, but flattened at the base, with a number of slightly raised longitudinal lines approaching each other near the tip. The depressions are without punctures. Each egg has a number of angular brownish spots distributed irregularly over its surface.

This box was overlooked for several days, and when examined again, the larvæ were found to have escaped and dried up for want of food.

SPIDERS NESTS.

BY WM. COUPER, OTTAWA, ONTARIO.

The genus *Theridion* construct beautiful silken nests for the protection of their eggs. I have collected what I take to be the nests of three species in Canada. They are generally found under the bark of decayed forest trees. Another which I found on an old fence at Quebec, although not constructed of silk, its form, in my opinion, is sufficient to class it among the architecture of *Theridion*. One of these nests resembles that of *Theridion variegatum*, Walck., of Europe. It is pyriform, having a diameter of ⅛th inch, covered with strong, glossy, golden silk thread, evidently arranged for a two-fold pur-

pose—to allow a free circulation of air, and to keep off too much moisture from the eggs. This nest is suspended by a silken thread from the acute end generally in a cavity of the inner bark. It contains from seven to ten unattached eggs. When the young spiders attain the parent form, they issue from the nest by a small hole at the latter end, which was formerly made by the parent for the purpose of introducing the eggs. I cannot say that the Canadian spider, which formed the above cocoon is identical with the European *T. variegatum*, Walck. But in order to show that the architecture is the same, I quote from the *Entomologist Weekly Intelligencer*, April 26, 1856: "On the 13th inst. I found, under the bark of an old hornbeam, at Hainault Forest, a little spider's nest, about the size of a pea, shaped like a balloon, covered with flossy silk of a fine red-brown color, and containing seven pellets, which had free motion. It was supported on a flexible foot-stalk, being altogether nearly half an inch in length, and formed one of the prettiest objects imaginable.—J. W. DOUGLAS."

The second form of nest or cocoon was found attached to the exterior bark of a birch tree at Quebec. It is sub-spherical, and measures ¼th of an inch in diameter. The interior covering is composed of a fine flossy, white silk, covered with numerous irregular red brown threads, similar to those described on the former species. The spider is unknown to me, but from its form and material, I have no doubt of its belonging to the genus *Theridion*.

The third form of nest is still more remarkably beautiful, and undoubtedly the work of a species of *Theridion*. It is always found under bark of trees, suspended to a thread about an inch in length. Its shape is oblong, acute at both ends, and composed of white silk. Although the exterior is covered with a coarse coating of silken threads, it is so transparent that the eggs can easily be counted. I have found its architecture at Quebec and Ottawa, and I have a vague recollection of finding it at Toronto. Not having been successful in rearing this species, I shall be glad to receive any information regarding its habits.

The fourth nest was found attached to a fence at Quebec. Although I have some doubts regarding the authenticity of the architect, its form and the manner in which it was suspended are the only reasons for classing it near the above genus. The curious part of this little nest is that it is not constructed of silk, but formed of woody fibre taken from the weather-worn fence on which it was found. At first, I doubted that it was the work of an Arachnidan, but on close observation, I detected the button of silk by which it was attached to the fence. Its form is spherical, measuring one-fourth of an inch in diameter. The pedicel is short, strongly made of woody fibre and silk, and it was firmly attached to the fence. This is the second instance that came under my observation of spiders using other material than silk to cover themselves while undergoing moult, or protecting their eggs when in the nest. I recollect

coming across a locality near Quebec, where a kind of long grass was growing. I noticed that the tops of several of the blades of grass were bent in a curious manner. This led me to open one of them, and in it and other specimens I found a spider undergoing moult. There was very little silk used in this form, which was constructed as follows: The spider first bent the top of a blade of grass downwards to a certain distance, attaching two of the edges together with silk; when it found this firm, it next proceeded to bend the remaining portion of the top upwards, thus inclosing itself in an oblong triangular cell, about an inch and a half long. This was indeed an ingenious contrivance to keep off its enemies.

I am anxious to obtain further information regarding the spiders that are found in this latitude, and which do not make use of silk, as a whole, to cover themselves or their eggs.

HABITS OF MELITÆA PHAETON.

I notice in the ENTOMOLOGIST, No. 4, some remarks on *Melitæa Phaeton*. I think there is something exceptional in the habits of this species, and I hope the observations of your correspondents may give us light.

On 1st May, 1868, one of my young friends in this neighborhood brought me eleven chrysalids of *Phaeton*, part of which he had found suspended to fence rails. He reported the caterpillars as crawling along the rails, and that he had tried to bring me some of them, but before he could reach me (living four miles distant) all that he had taken had changed to chrysalids. I directed him to search for the food plant.

He returned two or three times, and up to 18th May had brought me 80 chrysalids and but two larvæ, the latter of which changed within a few hours after I received them. My friend reported that he had taken part of the larvæ from the pawpaw bushes, on which they seemed to be crawling and not feeding, and could give me no more information on the subject. I was unable to go personally to the spot, but next May will endeavor to investigate fully. From all these chrysalids I scarcely obtained half a dozen butterflies, and part of these were cripples. They began to emerge on 18th May. These larvæ probably came from eggs laid the previous May or June, for there certainly is but one brood annually hereabouts. I have taken the butterfly in no year later than the end of June, and they could not have escaped my notice or the notice of some of my collectors here, if they had appeared later, or in a second brood. Vegetation with us is far advanced by 1st May, and by 1st April our shrubs are partly leaved out, so that larvæ emerging from the egg early in April would be at maturity early in May.

We have here several species of *Melitæa--Tharos, Batesii, Marcia, Harrisii*– all of which are double brooded, and which I believe pass the winter in the larval state. The habits of *Phaeton* seem to be generically different from these others. It belongs to the same group as *M. Arthemis*, of Europe, and Westwood describes this species as having its larvæ hatched in autumn, the young brood passing the winter under a common web, and as being full fed in April.

It is just possible that the eggs of *Phaeton*, although laid not later than June, may remain till October, and the young larvæ then be hatched, and that they spend the winter under a common web. But in this case they ought to be full fed by the middle of April, for they must be supposed to awake from their winter's sleep on the first warm days of spring, that is, not long after 20th March in this region.

At any rate here is a fair opportunity for investigation One thing is noticeable about *Phaeton*, that wherever it appears at all, it is very local and in considerable numbers in its locality, which is rather favorable to the web theory. Twenty or fifty may be taken on one spot, which is not the case with any other *Melitæa* that I know of.

W. H. EDWARDS.

Coalburgh, West Virginia, Jan. 6, 1869.

[The above communication arrived too late for insertion in our last issue; we accordingly took the opportunity of submitting it to Mr. B. Billings, of Ottawa, the only Canadian Entomologist, so far as we are aware, who has met with any number of the insect in question. He writes as follows: "I found the insect in a certain spot in 1866 and 1868, and in October last searched for the larvæ without success. In my notice (CAN. ENT. No. 4, p. 28) I specified the plants of the locality pretty fully, and am certain that it is upon one of these that it feeds. I have compared the vegetation of my locality with that of Mr. Edwards, and have arrived at the conclusion that it feeds there upon a different plant, but closely related in its botanical affinities, or containing some property common to both. I find that there are but three or four species that would or could probably occur as common to the two localities, and these are herbaceous.

"Assuming that the larvæ were but partially grown at the close of autumn, and spent the winter in a state of lethargy under a web, it would not be consistent to suppose that they would be attached to a plant whose stem dies down at the close of the season, and would be covered with water in the spring. I know that in the case of eggs this would be different, as they have a greater power of resisting the effects of moisture.

"Mr. Edwards has promised to investigate the matter next May, and no doubt he will succeed. Vegetation commences with him about five weeks

earlier than at Ottawa, and as I intend to be on the alert myself, my work will be comparatively lessened if I could be favoured with the result of his observations. Not that I expect to find it upon the same plant, but from its affinities or properties I can easily select the plant.

"There is a matter connected with this insect that I do not understand, that is, the cause of its local restriction. I know that the generally received opinion is that the localization of certain insects, such as Diurnal Lepidoptera, depends upon the existence of certain plants equally circumscribed in their habits. In the present instance the principal part of the plants are more or less local, inhabiting bogs, marshes, and swamps; but the most rare are found in many similar places over the country, where this insect does not occur. What, then, can cause the restriction of this insect to a circumscribed spot? Certainly, not altogether because it contains a certain species of plant. I suspect rather that it is partly due to topographical and other conditions, which involves a problem not easily solved."

Since the above was in type, we observed in the *American Naturalist* June, 1868, p. 218, a note by Dr. Packard on this insect, in which he states that "the larva hybernates through the winter, and may be found in early spring feeding on the leaves of the Aster, the Vibernum dentatum, and the Hazel."—Ed. C. E.

PARASITES IN THE CELLS OF VESPA MACULATA, LINN.

I collected several specimens of the nests of *Vespa Maculata*, Linn., last fall, for the purpose of studying their architecture. The cells of two nests carried home in October were infested with Hymenopterous parasites; one of these, I suppose to be a *Microgaster*, issued from a covered cell a few days afterwards. I obtained five specimens from this cell,—in which they occupied a longitudinal position, and each separated by a thin cocoon. It is evidently a Vespa pupa parasite, as I noticed that several covered cells had been occupied by it.—Therefore it occurs to me that they issue about the beginning of September, and afterwards hybernate. The length of the parasite is five-sixteenths of an inch.

The second, which I suppose to be the Vespa larvæ parasite, occupies about two-thirds of the open cells of the wasp. Their exterior cocoons are chesnut colored, and of a triangular shape, occupying the sides, near the bottom of the cells, where, in many cases, there are two parasite larvæ covered by one exterior cocoon, while each larva is enclosed interiorly in a strong oblong silken cell. The cells containing these parasites have been kept in a warm room since last October, and although the larvæ are quite active [Jan. 25th], no visible change appears to me to have taken place since the day they were

found. I describe these species in a paper on the Architecture of *Vespa Maculata* Linn, read by me a short time ago, before the Ottawa Natural History Society.

WM. COUPER, Ottawa, Ont.

MISCELLANEOUS NOTE.

HAIR SNAKES.—One day last Fall, a friend of mine, on stepping from his front door to the floor of the verandah, trod inadvertently upon a large spider. On removing his foot he perceived something, not naturally belonging to the spider, wriggling about on the ground, and on a closer inspection he discovered two minute snakes; these he brought to me, and I found them to correspond exactly with the description of the *Gordius*. They were, each of them, about two inches long, although when twisted up, as they were in tight knots, they occupied but a very small space. Their size was that of a horse-hair; their colour dark brown, almost black, the extremities being even darker than the intermediate portion.

Have you ever met with an instance of the *Gordius* making the body of a spider its temporary *habitat*? They are fresh-water *Abranchiata*, but my friend's house being near the river may possibly account for the fact of their being found in the body of the spider.—V. CLEMENTI, North Douro, Ont.

NOTE BY ED. C. E.—We have never met with a *Gordius* parasitic in a spider, having generally found them in grasshoppers, crickets, &c., and one in a beetle; but we are not surprised to learn that a large spider—probably one of those so common under stones on the margin of rivers—should be so infested.

NEW ENTOMOLOGICAL WORKS.

CATALOGUE OF THE ORTHOPTERA OF NORTH AMERICA, described previous to 1867. Prepared by Samuel H. Scudder. Washington: Smithsonian Institution, October, 1868. 90pp. 8vo. Price 75 cents.

The Smithsonian Institution has already given a great impetus to the study of many orders of insects in America by its publication of Catalogues and Monographs; it is now continuing the good work by the issue of the volume before us, which calls the attention of students and collectors to a hitherto much-neglected order. This Catalogue is an alphabetical list, according to genera, of all the species of Orthoptera which have been described by authors as inhabiting North America or the West Indies; while giving references to all the authorities for a species, it does not take any notice of synonyms, but merely reports upon the present state of knowledge of the order. The Institution proposes to publish Monographs of American Orthoptera and requests the assistance of specimens from any part of the Continent.

PACKARD'S GUIDE TO THE STUDY OF INSECTS. Part 5, January 1869. Price 50 cents.

This part contains a continuation of the order Lepidoptera, bringing down the account as far as the beginning of the *Geometridæ*. It is illustrated with two beautiful plates of *Telea polyphemus*, and about sixty wood-cuts. All our collectors of this favourite order ought to obtain at any rate the parts of this work that relate to it.

BOOKS RECEIVED.

The American Naturalist. Vol. I, No. 12, Feb. 1869. (Completing the volume).

Le Naturaliste Canadien, Bulletin des recherches, observations et decouvertes se rapportant a l'histoire naturelle du Canada. No. 1. Decembre, 1868. Quebec.

The first number of this new magazine, the prospectus of which we noticed in our last issue, is now before us. It consists of 24 octavo pages, with a wrapper, and is illustrated by a wood-cut of the Beaver *(Castor fiber)*. Besides much other interesting matter it contains a description of a new species of Hymenoptera,—*Urocerus tricolor*, Provancher, which is stated to bear some resemblance to *U. Cressoni*, Norton.

The Editor, in his introductory remarks, states that there are about a *million* French-speaking inhabitants in the Dominion of Canada, and hence infers that the time has come when they should have an organ in their own language specially devoted to Natural History. We certainly quite agree with him, and trust that his enterprise will be so abundantly successful as to utterly confute those prophets of evil who venture to characterise it as a fool-hardy and ruinous undertaking.

Proceedings of the Boston Society of Natural History. Vol. XII, Dec. 2, 1868.

Transactions of the American Entomological Society. Vol. I. No. 2. Containing numerous descriptions of new species of Hymenoptera by Cresson and Norton; Lepidoptera by Edwards, Grote, and Robinson; Coleoptera by Horn, Le Conte, and Zimmerman; and two splendid plates of Lepidoptera. Among the descriptions of new species of this last mentioned order, we notice two from Canada:—*Plusia Mappa*, G. and R. taken by Mr. Bowles at Quebec, and *Thecla Ontario*, Edw., taken by Mr. Reed at Port Stanley. (C. E. No. 3, p. 21).

The Canadian Farmer. Toronto. January, 1869.

The Maine Farmer. Augusta, Me. Dec. 26, 1868; Jan. 2, 9, 1869.

The Weekly N. Y. Sun. New York. Jan. 27, Feb. 3, 10, 1869.

W. Wesley's *Collection of* (21) *Catalogues* of Scientific Works, Philosophical Apparatus, etc. 81 Fleet Street, London, Eng.

The American Entomologist. St. Louis, Mo. Feb., 1869.

TO CORRESPONDENTS.

SUBSCRIPTIONS RECEIVED.—To Vol. I, from T. S. (per Mr. Reed); J. H. F., Detroit, Mich.; members subscriptions from W. O., and Rev. Prof. H., Toronto; N. H. C., Goderich; Rev. V. C., North Douro; B. B., and T. R., Ottawa.

SHEET CORK.—We have now on hand a large supply of sheet cork imported from the English manufacturer. Ordinary thickness for cabinets, 16 cents per square foot, extra thick, 24 cents.

ENTOMOLOGICAL ANNUAL FOR 1868.—It is proposed, should sufficient encouragement be given, to publish a Year Book of Progress in American Entomology, to be edited by Dr. A. S. Packard, jun. Dr. J. L. Le Conte will contribute a chapter on the Coleoptera; Mr. S. H. Scudder, chapters on the Butterflies and Orthoptera; Baron R. Osten Sacken, a chapter on the Diptera; Mr. P. R. Uhler, a chapter on the Hemiptera and Neuroptera; and the editor expects to receive aid from other entomologists. It is hoped it will prove a useful hand-book to every one interested in the study of insects. It will be published in 12mo size in the spring of 1869. An edition of five hundred will be printed, provided three hundred names can be secured. Will entomologists desirous of aiding in the publication of such an annual, send in their subscriptions in advance, that the means of publishing such a useful book be afforded at the outset? Subscriptions, Seventy-five Cents a copy, received by W. S. West, Peabody Academy of Science, Salem, Mass.

THE CANADIAN ENTOMOLOGIST is published on the 15th of each month by the Entomological Society of Canada. In consequence of the new Postal Law, which requires pre-payment of all Periodicals after January 1, 1869, we are constrained to make a slight change in the rates of subscription, as follows:—

To members of the Society, gratis.

To non-members (in Canada) 56 cents per vol., post-paid; two copies to one address, $1.

To subscribers in the United States, 62 cents per volume, free of Canada postage. The ordinary U. S. fractional currency may be sent.

To subscribers in Great Britain, three shillings per volume, post-paid. The amount may be sent in stamps.

Extra copies 5 cents each, 50 cents per dozen.

The *American Entomologist* ($1), and the *Canadian Entomologist* (56 cents), will be furnished, post paid, for one dollar and twenty-five cents ($1.25) per annum.

N. B.—Correspondence is invited respecting the habits, localities, occurrence, &c., of insects, as this journal is intended to be a medium for the recording of observations made in all parts of the country; insects for identification will be gladly attended to and returned when desired. Any contributions to the publication fund will be thankfully received and gratefully acknowledged.

The Canadian Entomologist.

VOL. I. TORONTO, MARCH 15, 1869. No. 8.

ENTOMOLOGICAL NOTES.

PAPER NO. IV.

BY. W. SAUNDERS, LONDON, ONT.

Hesperia mystic, Edw.—Two eggs were deposited by a beaten female in a pill box, on the 20th of June, color pale yellowish green; strongly convex above, flattened below, and depressed or slightly concave in the centre of the flattened portion. The surface appears smooth under a magnifying power of forty-five diameters, whereas in those of *Hobomok*, reticulations are plainly seen under a power of twenty. The egg of *Mystic* appears faintly reticulate under a power of eighty diameters. One specimen produced the larva on the 28th, the other on the 29th.

Appearance when fresh from the egg. Length one-tenth of an inch; head large and prominent, black and shining. Body above white with a slight tint of yellowish brown, which is more apparent towards posterior segments; second segment nearly encircled above with a line of black—under surface white; feet and prolegs of the same color.

July 14th. Length one quarter of an inch. Head not very large but prominent, dark reddish brown. Body above pale green, semi-transparent, darker along the middle of the body, much paler towards the extremities: second segment edged behind with a fine line of brownish black; on each side close to under surface is a fine line of dull greenish white. Under surface dull green with a faint yellowish tinge, feet and prolegs of the same color.

July 26th. Length .62 inch. Head large, dull red. Body above dull dark green with a faint tint of brownish red; downy with very fine short hairs scarcely visible to the unaided eye; second segment edged as before with brownish black; a dull whitish line along each side close to under surface. Below slightly paler; feet and prolegs pale, semi-transparent.

Appearance when full grown, August 7th. Length one inch. Onisciform. Head not large in proportion to the size of body, but prominent and much larger than second segment, dull reddish brown, edged with black posteriorly, downy with very minute whitish hairs.

Body above semi-transparent, dull brownish green, downy with fine whitish hairs similar to those on head, with a dorsal line and many dots over the surface of body of a darker shade; second segment pale whitish with a line of brownish black across the upper surface; terminal segments paler than the rest of body. Under surface slightly paler than upper with a semi-transparent glossiness; feet and prolegs whitish.

This larva was fed on grass, from a plant growing in a flower pot; only one attained its full growth—the other died while young. The full grown specimen, when about to enter the pupa state, attached itself to a piece of coarse gauze with which the flower pot was enclosed to prevent the escape of the larva—and here while undergoing its change it was attacked from the outside by a large spider which completely emptied the fresh pupa case and destroyed it. No description had been taken of the pupa up to the time of this untoward event.

Hesperia hobomok, Harris—Several eggs were deposited in a pill box by a female specimen about the 17th of June. Color pale green, nearly round, flattened on the side that is attached to the box. Under a magnifying power of twenty diameters they appeared plainly reticulated with fine six sided markings, strongly resembling the cornea of a fly's eye. Two specimens hatched on the 27th—two more on the 28th. The young larva on finding its way out commenced to eat the egg shell at the centre above.

Appearance when fresh from the egg. Length one-tenth of an inch. Head large and prominent, black and shining. Body above creamy white with a yellowish tinge towards the posterior segments; second segment half encircled above with a transverse line of black; under surface, feet and prolegs, similar in color to upper surface.

This larva also feeds on grass, stationing itself about the inside of the leaves near the joints, drawing portions of the leaves together with silken threads, forming a rude case in which it secretes itself. When placed on a strong ribbed blade, the edges of which it cannot bend, it spins a few threads from rib to rib, and places itself behind the threads. *Mystic* and *Wamsutta* have similar habits.

On the 14th of July these specimens were unfortunately lost; at this time they were about three-eighths of an inch long and very closely resembled *Mystic* of the same age.

Hesperia wamsutta, Harris—Several eggs were deposited by a beaten female July 10th. Egg pale greenish yellow, strongly convex above, flattened at the place of attachment; flattened portion slightly concave. Surface appears faintly reticulated under a magnifying power of forty-five diameters. On the 21st and 22nd the eggs grew darker in color, the larva appearing on the 24th.

Appearance of larva fresh from the egg. Length one-tenth of an inch. Head large and prominent, of a shining black color. Body above dull brownish yellow, dotted with black; examined with an eye-glass these black dots are very faint, but under a magnifying power of forty-five dtameters they appear very distinct, about ten or twelve on each segment, each emitting a single, rather long, brownish hair; second segment with a ring of brownish black encircling it above. Under surface rather paler than upper, slightly hairy; feet and prolegs partake of the general color.

These fed also on grass, but I was unsuccessful in my attempts to rear them; they all died while quite young.

NORTHERN INSECTS.

BY WILLIAM COUPER, OTTAWA, ONTARIO.

PAPILIO ASTERIAS, *Fab.*—A specimen of this butterfly was seen by me at Natashquaun, on the 24th June. On the 4th July, I found it common at a place further down the coast, called Musquaro. The same species occurs in Newfoundland.

PIERIS FRIGIDA. *Scudder.*—This butterfly is common at Natashquaun, where it appears about the 15th June. I am of opinion that it is double-brooded, as I noticed fresh specimens on my return to Mingan on the 16th July. It occurs on the whole of the south as well as the eastern coast of Labrador, where Mr. Scudder procured the species.

COLIAS INTERIOR, *Scudd.*—Captured a single specimen on the 22nd July, at Mingani. It is now in the collection of B. Billings, Esq., of this city.

ARGYNNIS CHARICLEA, *Ochs.*—On my arrival in Labrador, this was the first species that attracted my attention. First, on the 30th May at Attepetal Bay, where it was making its first appearance. Afterward at Natashquaun and other points down the coast, where it was extremely common. It is the *A. Boisduvalii* of Mr. Scudder's Labrador List.

ARGYNNIS BOISDUVALII *Sommer.*—Mingan is the only locality where I noticed this butterfly. I captured a few specimens on the 22nd July. Mr. Scudder informs me that this species is closely allied to his *A. Montinus* from the White Mountains. It is not the *A. Boisduvalii* of his Labrador List.

LYCÆNA LYGDAMUS, *Doubl.*—I captured a few specimens of this pretty butterfly on the 4th July, at Musquaro, where they were common. Not having a net or collecting-box at the time, I had to take them as best I could.

LYCÆNA SCUDDERI, *Edw.*—This species was noticed on the 1st June, at Little Watchsheshoo Harbor, but it became common along my route down the coast, and I am inclined to think there are two broods between the former date and the end of July.

LYCÆNA LUCIA, *Kirb.*—Common from the 1st June to the end of July. This species was first noticed by me at Watchsheshoo, early in June, when the weather was cold. They could then be easily taken by the hand.

At Mingan (July 22nd), I saw one specimen of *Argynnis* (probably *A. Aphrodite*, Fab.), but was not able to capture it. During my stay on the coast, I did notice a single species of *Hesperidæ*. If the family are represented in Labrador, I would have noticed some of them between the months of May and July. I visited ten rivers which enter the sea from the northern interior of the country, and I explored some of these river banks from five to ten miles inward, but found little of Entomological interest. It is only on the coast and in the immediate neighborhood of settlements that I was successful in procuring the material which I brought home. At Watchsheshoo, on a July evening, I noticed a species of Sphinx.

Mr. Cresson, of Philadelphia, thinks that I have been on the dividing line between the Canadian and Labrador faunæ. He is, no doubt, correct regarding the Lepidoptera, as the flora of the localities visited by me are mainly subarctic, intermixed with Canadian varieties, therefore where the former predominate it is reasonable to expect a local fauna. But it is not the case with Coleoptera, which, as I formerly stated, do not show any visible variety from those frequenting the district of Quebec.

I took two varieties (green and purple) of *Cicindela longilabris*, Kirby, at Natashquaun, where they were uncommon. I also procured some species of *Hymenoptera* and *Diptera* which are not determined.

MISCELLANEOUS NOTES.

A NEW THORN-LEAF GALL.—The European thorn *Crataegus crus-galli* Linn. has been cultivated for many years at Quebec, where it hedges gardens and farms in the vicinity of the city. The leaves of this thorn appear early in May, and about the beginning of June they are attacked by an insect which deposits its eggs in the fibre of the leaf. The galls are small, each the receptacle of a single larva, and from one to four may be seen on many of the leaves. These galls are composed externally of fibrous denticulated sprouts, which rise from the face of the leaf. The tops of the sprouts are beautifully ornamented with knobs of a reddish color. On separating the sprouts which enclose the mouth of the gall, a larva may be seen (in June) occupying a smooth cell in the same vertical position as *Salicis strobiloides* Osten Sacken, in the pine-cone gall of the willow. I have watched and tried to rear the larva from these thorn-leaf galls, but have not been successful in procuring the imago. In 1866, I sent specimens of the galls to Wilson Armistead, Esq., of Leeds, England, who has devoted upwards of twenty years to the

study of the British galls, and he informed me that my thorn-leaf gall was quite new to him. I found it common on thorns near Cataraqui. Can any of my Quebec entomological friends give me further information regarding it?—WM. COUPER, Ottawa, Ont.

HAIR SNAKES.—Dr. H. Hagen, of Cambridge, Mass., the well known Neuropterist, has communicated to our esteemed friend, Mr. Saunders, the following note on these curious creatures:—"Hair snakes in spiders are not so often observed. Haldeman and Leidy describe them as *Mermis robusta*, found in *Lycosa scutulata*, in North America (Proceed. Acad. Phil. vol. x., p. 58). Prof. Grube observed *Gordius aquaticus* in *Drassus fuscus*, Latr., in Prussia, two specimens in one spider. Prof. Siebold two *Mermis* in one *Micryphanti bi-cuspidatus*, Koch, in Bavaria. Duval, in Germany, observed one hair snake in *Miranda ocropegia*, Koch. Latreille one in a spider and one in *Phalangium cornutum*. Prof. V. Baer one in *Phalangium opilio*. You will find these observations in Prof. Von Siebold's Memoires in the Stettin Entom. Zeitung."

COLEOPTERA TAKEN IN THE NEIGHBOURHOOD OF LONDON, ONT., DURING THE SEASON OF 1868.

The following account is given in the hope of affording encouragement to youthful or intending collectors, and as some slight evidence of what a beetle-bottle and a nest of pill boxes, aided by vigilant eyes and a little perseverance, will procure for one who has so little leisure for Entomology as I have.

The list is compiled from a daily journal. [We regret that our limited space forbids our publishing Mr. Reed's list *in extenso*; the enumeration of the number of species will, however, testify to the success that has rewarded his diligence.—ED. C. E.]

Cicindelidæ, 6 species, April to August.
Carabidæ, 26 species, April to August.
Dytiscidæ, 5 species, July.
Hydrophilidæ, 5 species, April and July.
Silphidæ, 3 species, May and July.
Staphylinidæ, 3 species, May and July.
Histeridæ, 3 species, April, May and July.
Nitidulidæ, 4 species, April to July.
Cucujidæ, 1 species, April, rare.
Dermestidæ, 2 species, April and June.
Byrrhidæ, 1 species, June, very rare.
Lucanidæ, 4 species, May to July.
Scarabaeidæ, 15 species, April to September.
Buprestidæ, 6 species, May to August.

Elateridæ, 7 species, May to July.
Lampyridæ, 7 species, April to July.
Cleridæ, 3 species, April, May and August.
Ptinidæ, 1 species, July, rare.
Tenebrionidæ, 8 species, April to July.
Lagriidæ, 1 species, June, rare.
Pyrochroidæ, 2 species, May and July.
Anthicidæ, 1 species, June.
Melandryidae, 1 species, June.
Mordellidae, 2 species, May to July.
Meloidae, 1 species, August and September.
Oedemeridae, 1 species, July, rare.
Scolytidae, 3 species, April to June.
Curculionidae, 9 species, April to August.
Cerambycidae, 26 species, April to September.
Chrysomelidae, 13 species, April to August.
Coccinellidae, 10 species, April to September.

In addition to the above 180 species, which belong to 129 genera, and 31 families, I collected over 130 other species which want of leisure has hitherto prevented my determining. Many of the list were determined from the splendid collection of my friend Mr. Saunders.—E. B. Reed, London, Ont.

MEETING OF THE ENTOMOLOGICAL SOCIETY.

A meeting of the Society was held on the 16th ult., in the rooms of the Canadian Institute, Toronto. The following gentlemen were unanimously elected Members:

Charles E. Woolverton, Esq, Grimsby, Ont.
Dr. W. E. Milward, " "
Edward Bowslaugh, Esq. " "

A vote of thanks was passed to W. W. Saunders, Esq., of Reigate, England, for his very handsome donation of twelve boxes of European Diptera, sent by F. Walker, Esq., and received through the Smithsonian Institution, Washington, D. C.

NOTES ON CANADIAN LEPIDOPTERA.

PART II.

BY THE EDITOR.

In our previous notes we brought down the catalogue of corrections and additions to our Society's lists of Canadian Lepidoptera as far as the end of the Bombycidæ; we now come to the great family of Noctuadæ, in which there is still open so large a field of work for the American student.

In a late number of the Transactions of the American Entomological Society (vol. ii., pp. 67-88), Messrs. Grote and Robinson give a long list of errors that they have detected in our friend Mr. Walker's British Museum Catalogues of Lepidoptera. It appears that, during a recent visit to Europe, these gentlemen took the opportunity of examining the Museum collections, and comparing the North American specimens with material that they had brought with them for the purpose, and were thus enabled to identify many of Mr. Walker's species, and decide upon the merits of others. From our own experience of the insufficiency of many of the descriptions in these catalogues, and our having met with occasional errors in them, we feel compelled to accept this list of emendations, especially as its authors are well known as the chief and almost the only American authorities on this difficult family of Moths. We do not, however, wish to be understood as subscribing entirely to their strictures upon Mr. Walker's works, for we hold that a great deal is due to him for the enormous mass of material that he has brought together in them, and the immense amount of labor that he has bestowed upon their compilation. And who indeed can wonder that some errors should be detected in so vast a work, which perhaps no single individual should have been called upon to undertake?

In order to render our notes as brief as possible, we give the following names of species that are to be *struck out* of our Society's List No. 2, referring the reader to Messrs. Grote and Robinson's paper for the reasons in most cases:—

Acronycta longa, Guen.—This species was inserted in our list on the authority of the Brit. Mus. Cat. (ix. p. 60), which states that a supposed variety of it was taken at Orillia, by Mr. Bush. This variety has since been described as a distinct species by Mr. Grote (Pro. E. S. Phil. ii. p. 437, pl. 9, fig. 3), under the name of A. Noctivaga. We took the insect at Cobourg, in June, 1865.

Mamestra ordinaria, Walk.; *M. unicolor*, Walk.; *Apamea insignata*, Walk.; *A. demissa*, Walk.; *Miana undulifera*, Walk.; *Graphiphora expansa*, Walk.; *Xanthia spurcata*, Walk.; *Hadena contenta*, Walk.; *Xylina contraria*, Walk.; *Anthaecia rivulosa*, Guen., is the same as *A. marginata* (Haw.) Grote; *Homoptera obliqua*, Guen., a supposed variety of this species taken by Mr. Bush at Orillia (C. E. M. xiii. 1054) is a rubbed specimen of *H. minerea*, Guen.; *Homoptera calycanthata*, Smith (Bethune, Can. Jour. 1865, p. 251), according to Grote and Rob., is *Zale horrida*, Hubn. Not having access to Abbot and Smith's work, our erroneous determination was derived from Guenee's and Walker's brief descriptions, the latter of whom had mistaken Z. horrida for H. Calycanthata. *Hypena caecalis*, Walk.; *Ennychia glomeralis*, Walk.

Calpe Canadensis, Bethune.—This species is stated by Grote and Rob. to

be the same as *Plusiodonta (?) purpurascens*, to which (correcting the generic name to *Calpe*) they give the priority. We claim, however, that our name, *C. Canadensis*, do stand, as our description was communicated to the Ent. Soc. Philada. on Feb. 13, 1865, and published in their proceedings for March, 1865 (vol. iv. p. 213), whereas Mr. Walker's description appeared subsequently in the Brit. Mus. Cat. (xxxiii. p. 842), which bears date "July 1, 1865."

(To be Continued.)

BOOKS RECEIVED.

Le Naturaliste Canadien (No. 2, Janvier, 1867) contains several valuable and interesting papers, among which we may mention those on the Potato Disease (illustrated), the Beaver, the Study of Natural History, &c. We are pleased to notice the valiant manner in which the talented Editor takes up the cudgels in defence of his favorite science, and the summary manner in which he deals with the errors of non-scientific journalists, following in this way the notable example of our esteemed contemporary, the *American Entomologist*.

Proceedings of the Boston Soc. Nat. Hist. Vol. xii., Jan. & Feb., 1869.

On some Insects collected in Madagascar by Mr. J. Caldwell, and *Characters of a new Genus and Species of Chalcidites.* By F. Walker, F.L.S., London, Eng.

The Maine Farmer. Augusta, Me., Jan. 23, 30, Feb. 6, 1869.

The Canada Farmer. Toronto, Feb., 1869.

The N. Y. Sun. New York, Feb. 17, 24, 1869.

Notes on a remarkable variety of Papilio Turnus, &c. By W. H. Edwards, Coalburgh, West Va.

TO CORRESPONDENTS.

SUBSCRIPTIONS RECEIVED.—To Vol. i., from J. A. U. B., Montreal (with Am. Ent.); J. P. J., and S. B. D., Keytesville, Mo. (per C. Veatch). Members' subscriptions from Rev. W. A. J., Weston; J. M., Belleville; J. M. J., Halifax, N. S.

DONATION TO PUBLICATION FUND.—W. Saunders, Esq., of London, Ont., has very kindly sent us a donation of $2, for which we beg him to accept our best thanks.

C. S. M., Boston, Mass.—We have sent you the back Nos. of the *Canadian Entomologist*. Your note was our first intimation of your being a subscriber, Mr. Studley not having informed us of the fact.

W. C., Ottawa.—Sets of the *Canadian Entomologist* sent to Dr. V. C., and the Parl. Lib., as desired.

C. V. R., St. Louis, Mo.—Did not succeed in rearing the Strawberry Leaf-roller, as the specimens had become exhausted before they reached us. Shall try again. Believe them to be your *Anchylopera fragaria*. Many thanks for the photo.

The *American Entomologist* ($1), and the *Canadian Entomologist* (56 cents), will be furnished, post paid, for one dollar and twenty-five cents ($1.25) per annum. All communications, remittances and exchanges should be addressed to

"THE REV. C. J. S. BETHUNE, *Credit, Ont., Canada.*"

The Canadian Entomologist.

VOL. I. TORONTO, APRIL 15, 1869. No. 9.

ENTOMOLOGICAL NOTES.

PAPER NO. V.

BY W. SAUNDERS, LONDON, ONT.

In my last paper were concluded all the observations I have at present to publish regarding the rearing of butterflies from the egg. Before passing on to relate some experiments of a similar character with moths, I propose to give what further notes I have made in this family from captured larvæ, partially or fully grown.

Papilio Troilus.—Found feeding on spice bush *(Laurus Benzoin)*, August 3rd, full grown. The larva, as its habit is, had drawn together with silken threads one of the leaves, constructing thus a rude case in which it secreted itself during the day.

Length $1\frac{3}{4}$ inches, body thickest from third to fifth segment.

Head rather small, flat in front, slightly bilobed, dull flesh color with a faint tinge of brown.

Body above bright green, a yellow stripe across anterior part of second segment, edged behind with dull black. On fourth segment are two prominent eye like spots of dull yellow or yellowish buff, encircled with a narrow ring of black, and a large pupil of black filling most of the lower portion. The posterior part of this pupil is surrounded by a shining bluish black ring, the anterior portion of which reaches a little beyond the middle of the pupil. There is also a line of black in front, extending nearly across the yellow, and a pale pinkish spot above, margined with a slightly darker shade. On fifth segment are two large irregular spots of the same color, pale buff, encircled with a faint ring of black, and having a dull pink spot on the anterior portion of each. These latter spots are nearer to each other than those on fourth segment, a portion of the space between fifth and sixth segments is deep black; each segment from sixth to eleventh inclusive has four blue dots margined with black, those on seventh, eighth and ninth segments being largest. On each side, close to under surface, is a wide yellow stripe, gradually softening into the green above and edged below with blackish brown

Immediately below the spiracles is a row of blue dots, margined with black, one on each segment from sixth to twelfth inclusive.

Under surface dull pale greenish or yellowish white, having a decided reddish tinge as it approaches towards the yellow stripe on sides. Feet and prolegs partake of the general color.

Papilio Turnus. –Larvæ found feeding on cherry, July 14th. Length 1½ inches.

Head rather large, slightly bilobed, reddish brown sprinkled with very short white hairs.

Body above green, of a slightly darker shade on anterior segments, paler on sides of body, on which there is a whitish bloom produced by minute white dots with small short hairs of the same color issuing from them. Anterior segments of body wrinkled. On the anterior edge of second segment is a raised yellow fold, slightly overhanging the head, and on each side of fourth segment is an eyelike spot nearly oval in shape, yellow enclosed by a ring of black, centered with a small elongated blue dot, which is also set in black and has above it on each side a black line, nearly crossing the yellow spot. On posterior portion of fifth segment is a raised yellow fold, bordered behind with rich velvety black, the latter visible only when the larva is in motion; on the terminal segment is a similar fold, flattened above, with a slight protuberance on each side. On fifth segment in front of the yellow fold, are two blue dots, one on each side the dorsal line; there are also faint traces on hinder segments of a continuation of these dots in longitudinal rows.

Under surface of a paler green than upper, with a whitish bloom, prolegs of the same color, feet tipped with brown.

As the larva approaches maturity and is about to change, the color of body grows much darker, becoming dark reddish brown, the sides nearly black. The minute whitish granulations and the blue dots become more distinctly visible, giving the larva a very different appearance.

Both *Troilus* and *Turnus* winter in the chrysalis state. The first specimens of *Troilus* appear with us about the middle of June, becoming more abundant early in July. I think there is only one brood, but in this may be mistaken. *Turnus* I have taken on the wing from the middle to the latter end of May, but it becomes much more plentiful during July, and I incline to the opinion that there are two broods during the season.

Danais Archippus.– Larva taken full grown, July 18th, feeding on different species of Asclepias.

Length one inch and three quarters.

Head yellow with a triangular black stripe in front and another of a similar shape above.

Body above striped transversely with alternate black, yellow and white stripes—the white occupying the body of each segment, with a wide black stripe down the centre—the yellow chiefly between segments. On the third segment are two long black fleshy horns, and on the twelfth two others of a similar character, but shorter and not quite so robust.

Under surface black with a greenish flesh color between most of the segments, feet black, tipped with greenish, all excepting the posterior pair having a large white spot at their base outside.

The chrysalis is about an inch long, cylindrical, bright green, with two oval gold spots in front, one on each side the antennæ. A row of eleven gold dots, varying in size, encircles the lower portion; and a second row above of closely set gold spots, almost a continuous line edged anteriorly with black, is situated about the base of the moveable segments. Base of chrysalis black with several black dots about it.

I have never met with the larva of any *Argynnis* or *Melitæa* at large, although diligent search has often been made for them. The larva of *A. aphrodite* has been found by my esteemed friend, D. W. Beadle, of St. Catharines, feeding on the wild violet in the early part of June. On the 30th of June, I once found attached to the under side of a log, a pupa of *A. cybele*, which produced the imago in two or three days afterwards. The full grown larva of *aphrodite* and *cybele* may be looked for between the 5th and 15th of June. According to Mr. Beadle, they secrete themselves during the day under pieces of chip or rubbish.

Vanessa Antiopa.—Larva taken full grown June 20th, feeding on willow.

Length two inches. Head medium size, strongly bilobed, black with a few whitish hairs and roughened with small black tubercles. Body above black, thickly covered with small white dots, from each of which arises a fine whitish hair. A dorsal row of eight irregular spots or patches of a bright brick-red color, with two faint blackish dots on each. Spines black, rather long and slightly branching, four each on second and third segments, six on fourth and fifth, and seven on each from sixth to twelfth inclusive—the seventh spine on sixth segment is very small. Terminal segment with two pairs of short spines, one pair behind the other. Under surface similar to upper, with rather fewer white dots and hairs—feet black, lighter colored at base—prolegs dull red, with two small black dots and a few whitish hairs on the outside of each, excepting the terminal pair, which are black, tipped with red.

This species passes the winter in the imago state; they appear with the first warm sunny days of spring, hovering in numbers about the sappy stumps of recently cut trees. About the middle of June the imago becomes

very scarce, then disappears until the advent of the second brood early in August. I have several times kept the chrysalis of this insect over the winter, but they have invariably produced ichneumons in the spring.

Vanessa Milberti.—A description of the larva of this species was first published by myself in the second volume of the Proceedings of the Entomological Society of Philadelphia, page 28, but as this was unsatisfactory from its brevity and incompleteness, I have re-described it with fuller details.

Larva taken nearly full grown July 26th, feeding on nettle.

Length one to one and a quarter inches, cylindrical.

Head black, thickly covered with fine brownish white hairs, and sprinkled with many minute whitish dots.

Body above nearly black, thickly sprinkled with small white dots and fine whitish hairs, giving it a greyish appearance. Each segment, excepting the second, has a transverse row of branching spines—on the third and fourth segments, four—fifth segment six, and from fifth to terminal segments, seven. Terminal segment with two pairs, one pair behind the other. A greenish yellow lateral line, close to under surface, and above this a second broken line of a brighter orange yellow shade. All the spines and their branches are black, excepting the lower rows on each side from fifth to twelfth segments, these springing from the greenish yellow line are of a greenish yellow color.

Under surface dull greenish, with minute whitish dots. A wide central blackish stripe covering nearly the whole under surface of anterior segments —feet black and shining, prolegs green.

This insect I believe passes the winter in the imago state. I have taken it on the wing as early as the 24th April. It is double brooded; the first brood of larvæ reaching maturity about the middle of June, appearing in the imago state about ten or twelve days afterwards. The second brood of larvæ are full grown during the last week of July, and appear in the perfect state early in August.

Vanessa interrogationis.—Larvæ of this species full grown and partially grown were found together on the 7th August, feeding on the hop.

Description of young larva. Length half an inch. Head black. Body above black, with transverse rows of branching spines, those on third, fourth and terminal segments black, with a row of the same color along each side close to under surface. All the other spines pale whitish.

Under surface nearly black with dots of a pale hue.

Full grown larva. Length one and a quarter inches. Head reddish black, flat in front, somewhat bilobed, each lobe tipped with a tubercle, emitting five simple black pointed spines. Head covered with many small white tubercles mixed with a few blackish ones.

Body above black, thickly covered with streaks and dots of yellowish white. Second segment without spines, but with a row of yellowish tubercles in their place. Third segment with four branching spines all black, with a spot of dark yellow at their base. The fourth segment has also four spines; but all the others have seven excepting the terminal which has two pairs, one situated behind the other. Spines yellow, with blackish branches, excepting the terminal pair, which are black, and a row along each side near under surface of a reddish color.

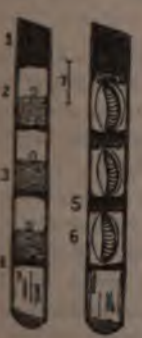
Under surface yellowish grey, darker on the anterior segments, with a dark central line and many small black dots. Feet black and shining, ringed with dull whitish. Prolegs with a dull reddish tint.

This larva feeds also on the Elm. Two broods of the perfect insect appear during the season; the first late in June, the second in August. I think the winter is passed in the imago state, although I have never met with the larva early in the season.

NEST OF CRABRO SEXMACULATUS, SAY.

BY WILLIAM COUPER, OTTAWA, ONT.

To your readers who study HYMENOPTERA, it may be interesting to learn something of the economy of a little Bee which was found at Quebec, by Mr. N. H. Cowdry, on the 11th April, 1865. The wood cut represents tops of raspberry canes, the pith of which was bored into, and emptied out by the parent Bee. 1. Orifice which was closed with some kind of vegetable substance. 2. Egg* of Bee attached to Pollen. 3. Pollen, all of which, under the microscope, appeared to have the same form and color (yellow), evidently mixed with honey. 4. Vegetable partition + on which the pollen rests, dividing one cell from another. 5. Ejectamenta of larva. 6. Larva. 7. Length of larva prior to change. As soon as the larvæ consume the equal quantity of food provided by the parent, each about the same time transforms into a pupa—but before this change, the force of nature constrains it to be further secured within the walls of its cell, and the final work of the larva, is to spin a thin silken



* On splitting open one of the canes on the 11th April, five cells contained pollen, and a flesh-colored egg rested in a sub-vertical position on the surface of each cell.

+ "It is necessary for the proper growth of her progeny, that each should be separated from the other, and be provided with adequate food. She knows exactly the amount of food which each grub (*larva*) will require during its growth; and she therefore does not hesitase to cut it off from any additional supply."—*Insect Architecture*, vol. I. p. 52.

cocoon wherein the pupa remains until it attains the parent form, about the end of June. Rennie informs us that the Carpenter Bee *(Xylocopa violacea)* of Europe "occupies several weeks in these complicated labors," and that as each egg " is separated from the other by a laborious process—the egg which is first laid will be the earliest hatched ; and that the first perfect insect being older than its fellows in the same tunnel, will strive to make its escape sooner, and so on of the rest. The careful mother provides for this contingency. She makes a lateral opening at the bottom of the cells. Reaumur observed these holes in several cases, and he further noticed another external opening opposite to the middle cell, which he supposed was formed, in the first instance, to shorten the distance for the removal of the fragments of wood in the lower half of the building." It is apparent that this mode of exit does not occur in the raspberry canes occupied by the Canadian species—and the fact that all the eggs examined in a series of cells, on the 11th of April, were of equal freshness, induces me to state that I am not satisfied with Rennie's statement as to its being obvious that Bees occupying the lower cells will be hatched before those in the upper. There may be, in some species a short lapse of time between the perfection of each individual in a series of cells, but it is of little consequence, and does not incommode them. It appears to me that they make little effort to escape until the uppermost cells are vacated. I have seen a species of *Megachile* two days cutting through its cocoon, and it seemed in no hurry to leave its cell ; while during this time other specimens that occupied the same group of cocoons, came forth, one after another.

I sent this raspberry boring Bee to Dr. Packard, and I quote from his letter dated May 8th, 1866, as follows :—" I am glad to trace the habits of this species *(Crabro sexmaculatus, Say)*. I only wish I had a larva and pupa. They build often in the empty hollow stems of elders and raspberries, occupying and refitting the holes excavated by *Ægerians* and other borers." It will be seen from my description of the nest and larva food of this species that it does not agree with the usual habits of *Crabronidæ*, the food of the larvæ of our genera of the latter family, as hitherto recorded, consists of *Articulata*. The Bee obtained from the raspberry canes, is a small obscure insect, a little over two-fifths of an inch long, and the only specimen in my possession is now broken, having lost the abdomen. I do not remember noticing spots on any of the specimens, and I am satisfied that the one in my cabinet is a duplicate of that sent to Dr. Packard. Not having Say's description, I am at a loss to understand his reason for naming this insect *sexmaculatus*. Is the male spotted, or is it possible that there are two kinds of females, as occur among the *Apidæ*. If the latter is the case, has our *Crabro* one with six spots, and the other spotless ? These questions are not penned with a view of disputing its identity. The words previously quoted are conclusive that I communicated to Dr. Packard what I then knew of its history. Thus, then, we have discovered another species of the Parasitic Genus *Crabro*, generally known as Sand

Wasps, imitating the habits of *Prosopis** and *Sphecodes* among the *Andrenidæ* and *Ceratina*†, *Xylocopa*, and other wood-boring or what are termed Carpenter Bees among the *Apidæ*. With increased knowledge, I have no doubt, but that other species, hitherto classed among the Parasitic Hymenoptera, will be found making nests in similar situations, and provisioning the cells with vegetable substances.

NOTE BY ED. C. E.—Say (Ent. Works i. p. 230) describes the female C. *6-maculatus* as "Black, tergum with three yellow spots on each side."

MISCELLANEOUS NOTES.

MR. COUPER'S THORN LEAF GALL.—In No. 8 of the CANADIAN ENTOMOLOGIST, Mr. Couper requests additional information respecting a Gall found by him on *Cratægus crus-galli*, which is said by him to be a "European thorn." The common European white thorn, by the way, is *Cr. oxyacantka*, and *Cr. crus-galli* is an American species, according to Gray; so that I scarcely know what thorn he refers to.

As to the Gall briefly described by him, I think it must be identical with a Cecidomyidous leaf-gall, which grows very sparingly near Rock Island, Ills., U. S., on *Cr. tomentosa*. That Mr. Couper may judge for himself, I copy the description of my gall from my Journal.

"GALL CRATÆGI BEDEGUAR.—A sub-globular gall, about 0.50 inch in diameter, growing on the main rib of the leaf of *Cratægus tomentosa*, generally below, but sometimes above. It branches out into long slender sprangling filaments, which are green and very often tipped with rosy, resembling those of

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* "*Prosopis*, though destitute of the usual apparatus for collecting honey, has been recently proved a honey producer nevertheless. Its nest has been discovered in tubes formed in the main stems of the bramble, and in the nest, filmy cells, containing liquid honey. *Sphecodes*, though without the usual polleniferous organs, and consequently thought to be Parasitic, has been watched by that indefatigable entomological observer, Mr F. Smith of the British Museum, while in the act of forming its burrow; an act which appears to afford conclusive evidence in favor of the non-parasitic habits of this genus of Bees.—*Humphrys*, in "*The Intellectual Observer*," May, 1862.

† Spinola tells us "that one evening he perceived a female *Ceratina* alight on the branch of a bramble, partly withered, and of which the extremity had been broken; and after resting a moment suddenly disappear. On detaching the branch he found that it was perforated, and that the insect was in the very act of excavating a nidus for her eggs. He forthwith gathered a bundle of branches, both of bramble and wild rose, similarly perforated, and took them home to examine them at leisure. Upon inspection he found that the nests were furnished, like those of the same tribe, with balls of pollen kneaded with honey, as a provision for the grubs."—*Annales du Museum d'Historie Naturelle* x. 336.

the "bedeguar" gall, common on the Rose in England. The larva is cecidomyidous, of an orange color, with a dark Y-shaped breast-bone, and as usual inhabits a cell with smooth internal walls to it, in the middle of the gall. Occurred July 19th."

I am acquainted with three other Cecidomyidous leaf-galls on *Cratægus*, one of which (*Cratægi plica*, Walsh M. S.) grows on *Cr. crus-galli*, and two (*Cr. limbus*, Walsh M. S. and *Cr. globulus*, Walsh M. S.) on *Cr. tormentosa*, besides a singular Acaridous leaf-gall, which looks like a slender pale-green worm, wriggling through the crinkled parenchyma of the dark green leaf, and which is found locally, but in profuse abundance, both on *Cr. tomentosa* and on *Cr. crus-galli*. The mite-larvæ of this last, to which I have given the M. S. name of *Cr. vermiculus*, are remarkable for being of a beautiful rosy color.

It was from the above-named gall *Cr. plica*, that I obtained great numbers of the larvæ and imagos of *Anthonomus cratægi*, Walsh, which is inquilinous in this gall, as I have stated in my paper on Willow-galls, *Pro. Ent. Soc. Phil.* VI. p. 226.—Ben. D. Walsh, Rock Island, Illinois, March 22, 1869.

Melitæa Phaeton.—Mr. W. H. Edwards, (Coalburgh, West Va.), writes "I should like to know from Mr. Billings, what are the plants which he says might be common to the Ottawa district and to this, and on which I might find the larva of *M. phaeton*. The figure of the larva of Phaeton in Packard's *Guide* does not represent the species, or the genus, but something of the Arctian type."

Mr. B. Billings (Ottawa, Ont.), replies as follows:—"The plants referred to by Mr. Edwards, are *Thalictrum cornuti*, *Chelone glabra*, *Cypripedium pubescens*, and *C. spectabile*. They are all northern, but range southward, and the last may be rare. *Myrica gale* (a shrub), ranges along the mountains in Virginia, and it is not impossible that *Cornus stolenifera* may be found similarly situated.

"The Canadian Entomologist, No. 7, recites a note by Dr. Packard, in which he states that the larva of *M. phaeton* feeds upon the Aster, Hazel, and *Viburnum dentatum*. The Viburnum specified is common here in swamps, and six other species of the same genus are common in the neighborhood. I saw none of them, however, in the enclosure where I met with *M. phaeton*, but on the outskirts of the thicket, about forty rods from the swamp, I saw several plants of *V. Lentago*.

"As for Asters and Hazel, I do not recollect having seen them. I am confident that they do not grow in the swamps, but no doubt they occupy the high land, or intervening thicket, at no great distance from it. Our only species of Hazel is *Corylus rostrata*; the species of Aster are numerous, and as they are everywhere abundant in thickets, they must surely grow here.

"Whatever the larva feeds upon, it will not have much to eat for the next six weeks, as the whole country is covered with snow yet (April 5), two to three feet deep, and I do not expect to see the last of it in the swamps till the end of May!"

Snow Flies.—The first mild days, about the beginning of March, every winter, bring out, on the banks of the River Credit, an immense number of neuropterous insects, called in this neighborhood "Snow Flies," from their habit of crawling over the surface of the snow, and appearing when it is even two or three feet deep. Their proper name is, I think, *Capnia Pygmæa*, Burm. (*Perla Nivicola*, Fitch, "Winter insects of E. New York"—a work that I have not seen); a technical description of them is given in Hagen's "Synopsis of N. American Neuroptera," p. 32. They are of a shining black color, with dusky black-veined wings, which are rudimentary in the male, but rather ample in the female; the antennæ are rather long, with numerous articulations; the abdomen is terminated by two long setæ; the female is usually about double the size of the male, but the individuals of each sex vary very much in size, some males being under a-fifth of an inch in length, while some females are over half an inch. I once found a few individuals crawling on the deep snow near a stream back of Cobourg, on March 1, 1865; but in this neighborhood they literally swarm for some weeks on the bridges, trees, &c., and on the snow about the river, even coming into houses some seventy feet above the water. In 1867, the first specimens appeared on the 26th of February; in 1868, on March 8th. This year I saw the first specimen on March 2nd, a bright, mild, thawing day, snow about two feet deep on the level; March 7th, a few more were seen; March 21st, quite numerous; April 10th, still plentiful. Their early appearance, long before the departure of the snow, must afford a welcome supply of food to the small birds that anticipate the advent of spring.—C. J. S. B., Credit, Ont.

The Alder-Bud Gall.—Another gall is common at Quebec on the Alder (*Alnus incana*, Willd). These galls are formed by the insect early in June, when the young buds are springing from the branches. I have counted from three to six orange-colored larvæ in each of these galls. They occupy separate cells between the thick young leaves, which are thus deformed by the puncture of the insect, forming a gall either round or semi-conical. One of these galls, about twelve months in my possession, was lately opened. It contained four orange-colored larvæ, one pupa of the latter, and one Inquiline of a brilliant green color. I sent this gall to Mr. Armistead, who informed me that although larger, it is similar to one on the European Hazel. I intended to have traced out the insect that produced them, but having to go to Labrador during the summer of 1867, I had not another opportunity to obtain specimens. In order to further investigation, I may mention that this gall will be found in June, in a wood north-west of Spencerwood.—W. Couper, Ottawa.

HAWTHORN FRUIT MINER.—About the end of June, 1867, I attempted to rear a species of *Micro-Lep.*, which I discovered mining the fruit of an uncultivated Hawthorn, growing on the Island of Orleans, opposite Quebec. A lot of the Haws were collected, and carelessly thrown into a box containing the pith of a plant. Some days afterwards, on examining the Haws, I noticed that they had become dry, and several larvæ were dead. A few that were larger and better fed, took to the pith, into which they bored, and changed. The insect came forth, but there was something wrong; not one expanded its wings. As the chrysalis of this little moth is different from any form that I have ever seen, I give as perfect a description of it as could be obtained at the time:—Flesh-colored, excepting the fore part of the head, which is reddish. A longitudinal black line on the dorsal region. Body consists of about nine rings. The antennæ extend to the apex of wing sheaths, terminating in sharp prominent divergent points. Directly behind the points of the latter, are two conspicuous appendages, having bur-like tops, and by which I found the exuvia attached to the wall of its hiding-place. Length 5-20th inch. Can any of your correspondents inform me to what genus this Lep. belongs?—WM. COUPER, Ottawa.

NEW WORK ON THE BUTTERFLIES OF NEW ENGLAND.—Can I find a place in your valuable little sheet to announce an illustrated work on the Butterflies of New England, and to ask the aid of Entomologists in its preparation? It will include not only the New England species but all those of the adjacent regions, and, as it is to appear *within a year*, I shall need the assistance of all collectors and working Entomologists in obtaining eggs, larvæ, and pupæ for description, and as material for colored illustrations. One person may find what will escape another, and the admirable method of obtaining eggs and raising larvæ recounted by Mr. Saunders in your Journal, opens a ready field for recreation and instruction. I am anxious to obtain living specimens in every stage, and will give the amplest credit to all original contributions. All specimens sent may be forwarded to my address below, and should also be marked "Insects" that they may receive immediate attention on their reception. I shall be happy to correspond with any one wishing to help me.—SAMUEL H. SCUDDER, Boston Society of Natural History, Berkeley St., Boston, Mass.

BOOKS RECEIVED.

Revision of the Mole Crickets. By S. H. Scudder. Being the first memoir of the Peabody Academy of Science, Salem, Mass. (Price $1.25.) An admirable memoir on this curious family of insects by one of the best American authorities on the order to which they belong. The press of the Essex Institute certainly deserves the highest commendation for the remarkably beautiful specimens of typography that it issues; the work before us is a marvel of excellence, both as regards the paper and printing. The large plate with which it is illustrated is also exceedingly well done.

A Guide to the Study of Insects. By A. S. Packard, Jr., M. D. Part vi., March, 1869. (50 cents.) This part completes the account of the Moths, and begins the description of the Diptera. It is illustrated with a handsome new steel plate, figuring the transformation of Moths, and about fifty wood-cuts. The author now announces that four more parts will complete the work.

Le Naturaliste Canadien. Nos. 3 and 4, Feb. and March, 1769. Quebec, P. Q. ($2 per annum).

The Canadian Naturalist and Geologist with the Proceedings of the Natural History Society of Montreal. New series, Vol. iii., Nos. 4, 5, and 6, Jan to Dec., 1868. ($3 per vol.)

Proceedings of the Boston Soc. Nat. Hist. Vol. xii., March, 1869.

The American Naturalist. Salem, Mass., Vol. iii., Nos. 1 and 2, March and April, 1869. ($4 per annum.)

The Weekly N. Y. Sun. New York, March 3, 10, 17, 24, 31, 1869. ($1.)

The Canada Farmer. Toronto, March, 1869. ($1 per annum.)

The American Entomologist. St. Louis, Mo., March and April, 1869. ($1.)

The American Agriculturist. Orange, Judd & Co., 254 Broadway, New York, March and April, 1869. A very handsomely illustrated publication for farmers and gardeners. ($1.50 per annum.)

The Cynthia Silk-worm. By W. V. Andrews.

An Essay on Entozoa, Observations on the Building Stone of the Ottawa Country, and *An Essay on the native compounds and metallurgy of Iron.* By Dr. E. Van-Cortlandt, Ottawa, Ont.

History and Condition of the Portland Society of Natural History from 1866 to 1869. We know of no scientific society that has been so singularly unfortunate as that of Portland, Maine; twice its hall and cabinets have been destroyed by fire. In 1854 it lost every species of property that belonged to it by the burning of the Custom House, and in the fearful conflagration of

1866 it lost its commodious building, splendid collections, everything indeed except its library, which was only saved by the exertion of a few of the members and at the peril of their lives. It now appeals for help from Naturalists everywhere, in the shape of books, specimens, and money, for which returns of native specimens will be made as far as practicable. We shall be happy to receive and forward any specimens that our Canadian readers may send us for the purpose.

The Record of American Entomology, 1869 We are glad to learn that a sufficient number of subscriptions has been received to warrant the issue of this annual, the prospectus of which we published in No. 7. As the book will be larger than at first imagined, the price to new subscribers is raised to $1. Subscriptions to be sent to W. S. West, Peabody Academy of Science, Salem, Mass.

TO CORRESPONDENTS.

Subscriptions Received.—To Vol. i, from W. V. A., New York; H. S. S., Buffalo; Prof. A. J. C., and Agricult. College Lib., Lansing, Mich., (per G. T. F.); C. S. M., Boston, (per R. P. Studley & Co.); E B, Boston; 10 subscriptions per *American Naturalist's* Book Agency.

W. V. A., New York.—Notices of specimens *for sale* can only be inserted as advertisements, the rate for which is ten cents per line; ditto *for exchange*, gratis to subscribers. The Ailanthus grows very well in this part of Canada.

E. H. C., New York.—Your note of January 28, we chanced to receive at the Toronto P. O. the other day—our address is "Credit, Ont." Specimen numbers sent.

Postage from the United States.—We would respectfully remind our correspondents that the postage on letters from the United States to Canada, is *six cents;* a three cent stamp on such letters is merely thrown away, as we are then charged the unpaid rate of ten cents; it is rather aggravating to find thirteen cents paid between us, when six cents are all that are necessary.

Exchange of Lepidoptera.—I should be glad to get up an exchange of Lepidoptera with some Canadian collector.—W. V. Andrews, 130 Charlton Street, New York.

Errata.—No. 3, page 18, 4th line from bottom, for *Calliumorpha* read *Callimorpha.*

No. 6, page 48, 4th line from bottom, for *President* read *Press.*

No 7, page 60, third line from top, for *larval* read *chrysalid.*

No. 7, page 68, fourteenth line, for *Mr. Cresson of Philadelphia* read *Mr. Scudder of Boston.*

The *American Entomologist* ($1) and the *Canadian Entomologist* (56 cents) will be furnished post paid, for one dollar and twenty-five cents ($1.25) per annum.
All communications, remittances and exchanges, should be addressed to
"The Rev. C. J. S. Bethune, *Credit, Ont., Canada.*"

The Canadian Entomologist.

VOL. I. TORONTO, MAY 15, 1869. No. 10.

NOTES ON CANADIAN LEPIDOPTERA.

PART III.

BY THE EDITOR.

(Continued from page 72.)

In our last notes we mentioned the names of various species of moths that, on various grounds, , are to be dropped from our list of Canadian Lepidoptera; we now proceed to mention those that are to be *added* to the list, as having been captured or determined since its publication in 1865. These, of course, are only what have come under our own notice, but we have no doubt that the number might be largely increased by our readers, notwithstanding that the last two years have been so peculiarly unfavorable to the collectors of Lepidoptera in this country.

Acronycta occidentalis, Grote & Rob. (Pro Ent. Soc. Phil vi. 16)—Taken at London by Mr. E. B. Reed.

Acronycta funeralis, Grote & Rob. (Pro Ent. Soc. Phil. vi. 17, pl. 4.)—Taken at Grimsby by Mr. Pettit.

Acronycta morula, Grote & Rob. (Trans. Am. Ent. Soc ii. 196, pl. 3.) Several specimnes taken at sugar, at Cobourg.

Acronycta superans, Guen.—Numerous specimens taken at Cobourg in June, 1865, at sugar. This handsome species may be readily distinguished by its dark primaries, which are conspicuously mottled with white, and have a luteous or orange-colored spot at the base of the inner margin.

Hydroecia sera, Grote & Rob. (Trans. Am. Ent. Soc. i. 345, pl. 7.)—Taken in Canada by Mr. Bowles, of Quebec.

Caradrina multifera, Walk. (C. B. M. x. 293).—Taken at Cobourg. Mr. Walker mentions its capture in Nova Scotia by Lieut. Redman, and thus describes it :—"Cinereous. Thorax and fore wings with blackish speckles. Fore wings with black marks on the costa, with blackish zig-zag transverse lines, with two brownish bands, and with brown marginal dots; orbicular spot small; reniform large, nearly fusiform. Hind wings with whitish ciliæ. Length of body 5 lines; of wings 12 lines."

Agrotis murœnula, Grote and Rob. (Trans. Am. Ent. Soc. i. 352, pl. 7)—Taken at Cobourg. Distinguished by the pearly grey primaries, which are almost destitute of markings; the reniform spot, which forms a blackish blotch, and the dotted transverse posterior line, being alone conspicuous.

Agrotis subgothica, Haworth (*Feltia ducens.* Walk.)—Taken at Orilla by Mr. Bush.

Graphiphora triangulum, Guen.—An European species, taken in many parts of Canada. The primaries are pale brownish, often with a rosy tinge; the basal transverse line is margined with black on both sides, the anterior on the external side; a dark brown or black spot before the orbicular, which is very distinct and well defined, and another black spot between it and the reniform; the claviform spot, as well as the two others, is well marked; sub-terminal line distinct, whitish, preceded by a blackish spot on the costa. Secondaries greyish brown, with paler cilia. Alar expansion 1.4 to 1.6 inch.

Graphiphora Dahlii, Hubn.—Among a collection made by Mr. D'Urban, in Lower Canada, and sent out from England by him to Mr. Reed, of London; the specimens were all determined by Mr. Walker. The species may be briefly described as follows:—Primaries reddish-brown; transverse lines almost obsolete, hoary; median space dark; orbicular spot large, elliptical; reniform conspicuous from its paler margin; secondaries grey-brown. It is recorded as a not uncommon insect in England, and has also been taken in the State of New York.

Xanthia ferruginea, Hubn.—Another European insect, the larva of which is said to feed on the young buds of the poplar. It is not uncommon in Canada in September and October, and even sometimes as late as the end of November. The general color of the primaries is reddish-ochreous, more or less shaded with grey; transverse lines undulating, distinct; orbicular spot pale, of the ground color, but distinctly margined; reniform well defined with its lower half dark grey; a narrow transverse median shade, and a terminal shade clearly divided by the pale undulating sub-terminal line. Secondaries paler ochreous, with transverse median sub-terminal darker lines. Alar expansion 1.4 to 1.6 inch; length of body 0.6 inch.

Xylina Bethunei, Grote & Rob. (Trans. Am. Ent. Soc. i. 354, pl. 7).—"Readily distinguished by its pale color and ochraceous shadings." Named by the authors after the editor of this journal, who has taken the species at Cobourg, Toronto and Credit, in the months of September and October. It has also been taken by Mr. Pettit at Grimsby, and in other localities.

Cucullia convexipennis, Grote & Rob. (Trans. Am. Ent. Soc. ii. 201, pl. 3.) —"*Habitat*, Atlantic District. Imago flies in July and August. Easily distinguished from the described North American species of the genus by the

convex external margin of the wings, while the primaries above are very distinct in appearance." Their general color is dull pale ochraceous, deeply shaded on the apical half of the costa, and on the inner margin with dark ferruginous. A specimen of this insect has been sent us by Mr. J. M. Jones, President of the Nova Scotian Institute of Natural Science, Halifax, N. S.

Anarta luteola, Grote & Rob. (Pro. Ent. Soc. Phil. iv. 493, pl. 3.) –Taken by Mr. W. Couper in the vicinity of Quebec. Primaries black, with the reniform spot very conspicuous, white; secondaries clear yellow, with a broad neatly defined black border of uniform width. Alar expanse 1.00 inch, length of body 0.50 inch.

Anarta Acadiensis, Bethune.—A full description of this new species will appear in the forthcoming number of the Transactions of the Nova Scotian Institute of Natural Science; we shall take an opportunity of transferring it to the pages of this Journal at some future time. The species was determined from a specimen sent us by Mr. J. M. Jones.

Phesia mappa, Grote & Rob. (Trans. Am. Ent. Soc. ii. 204).—This very beautiful species is described from a specimen taken by Mr. Bowles at Quebec. We have received a specimen from Mr. J. M. Jones, of Halifax, N. S., and have seen others that were taken in this Province. Its general color is purple rosy, with shades of very deep brown and black, and numerous golden dots and markings.

Anomis grandipuncta, Guen.—Determined for us by Mr. Walker. Taken in great numbers at Cobourg in September, 1865, and not uncommon in various parts of Ontario. In the British Museum Catalogue (Lep. Heteroc. xiii. 989) the specimens are stated to be from South America and the West Indies. The primaries are pale fawn-colour tinged with roseate, with a few scattered reddish streaks representing the transverse lines, and a large blackish-white speckled discal spot in the place of the reniform; secondaries dark greyish cinereous. Alar expansion 1.50 inch; length of body 0.50 inch.

Xœnia typica, Linn.—A common European insect, also taken in the United States, sent to Mr. Reed in Mr. D'Urban's collection made in Lower Canada The following is Mr. Stainton's description (Manual, i. 212): "Fore-wings brown, marbled with dark brown; the lines paler; the veins and margins of the stigmata whitish ochreous: hind-wings dark grey. In June. *Larva* greenish grey, with a faint rosy tint in the incisions; a row of oblique whitish streaks intersect the dark grey sub-dorsal line, and those on the 11th or 12th segments are followed by a black streak; spiracular line whitish, edged above with blackish *(Duponchel)*. On dock, willow-herb, &c. When young the larva is quite gregarious, and almost defoliates the plant on which it occurs."

Syneda Hudsonica, Grote & Rob. (Pro. Ent. Soc. Phil. iv. 494, pl. 3).—

We took a specimen of a lovely moth at Credit last year, which we consider to be this species. It chiefly differs from the G. &R.'s description and figures in the much greater width of the black markings on the secondaries, thus leaving much less of the extremely pale yellow ground colour. We do not attempt a brief description, as it would necessarily be quite inadequate ; we must therefore refer our readers to the full account by the authors.

Parthenos nubilis, Hubn.—This handsome species of the family *Catocalidæ* may be readily distinguished by its beautifully mottled black and white primaries and luteous secondaries, the latter especially being remarkable for having *three* undulating black transverse bands, and a marginal series of confluent, round black spots. We took several specimens at Credit in June, 1868, mostly attracted by light.

Erebus odora, Linn.—Two specimens of this gigantic moth have been taken in Canada ; one by Dr. Sangster at Toronto, the other by Mr. B. Billings at Ottawa. In the British Museum Catalogue specimens are related to have been captured on the " West Coast of America," " off the Coast of Brazil, 120 miles due East of Espirito Santo," Brazil, West Indies. It has also been taken in the United States. The wings expand about five inches and are deep blackish, with numerous transverse black lines, and on the primaries a large incised discal spot.

Remigia latipes, Guen.—Taken at Cobourg, and also by Mr. Pettit at Grimsby. Distinguished by its extraordinary posterior tarsi, which are densely fringed with excessive long hairs. The primaries are cinereous, thickly sprinkled with blackish scales ; the two interior transverse lines are distinct, almost straight, oblique and converging ; discal spots tolerably distinct, finely margined with black , subterminal space much darker, sharply defined anteriorly by the posterior transverse line ; submarginal line indicated by a row of blackish spots. Secondaries dark cinereous, with a transverse line of blackish spots, and a broad blackish border. Alar expansion 1.75 inch ; length of body 0.7 inch. This species was determined for us by Mr. Walker.

The following species, of other families than the *Noctuadæ* are also to be added to our Canadian Lists :—

Drymonia ? confusa, Walk. (Cat. Brit. Mus. xxxii. 413). Taken at Orillia by Mr. Bush.

Dasychira clandestina, Walk. (Can. Nat. & Geol. vi. 36, Feb., 1861.) Taken by Mr. D'Urban at Bevin's Lake, Montcalm, P. Q., July 7th, 1869. A specimen of this insect is in the collection before alluded to, sent by Mr. D'Urban to Mr. Reed.

Anisopteryx vernata, Peck. (Harris' Ins. Mass. p. 461) : This destructive insect, well-known under the name of " Canker-worm," is related in the

Canada Farmer, for May 1 1867, to have been taken at Grimsby in the previous November by Mr. Pettit.

Larentia geminata, Grote & Rob. (Pro. Ent. Soc. Phil. vi. 29, pl. 3).—"Readily distinguished by its pale coloration, its conspicuous irregular black bands associated with faint yellowish coincident shades." Taken by Mr. Pettit at Grimsby, also found in other localities.

Carpocapsa pomonella, Linn.—Strange as it may appear, this terrible pest of fruit growers, the Apple Codling Moth, which destroyed probably one-half of the apple crop last year in Canada, has not had its name entered upon our List of Native species; we only wish it were an entire foreigner. A good account, with figures, of the insect is given in our friend Mr. Riley's First Report, p. 62.

Pempelia grossulariæ, Packard. (*Guide*, Part vf. p. 331, fig. 254). This new Gooseberry worm, first discovered by our esteemed coadjutor, Mr. Saunders of London, Ont., must now be added to our List. An excellent account of it in all its stages is given in Mr. Riley's Report, p. 140.

Anchylopera fragaria, Walsh & Riley. (Amer. Entom. i. 89, fig. 75, Jan. 1869.) "The Strawberry Leaf-roller"—another new destructive insect which, *vide Canada Farmer* (Feb. 1869), is also to be added to our List.

Now that we have completed our task, and brought our List of Canadian Lepidoptera—with many omissions no doubt, but to the best of our ability—down to the present time, we trust that our readers will assist us in recording in the pages of the CANADIAN ENTOMOLOGIST, any new additions that may be made from time to time to our knowledge of the Leidoptera of this country.

MISCELLANEOUS NOTES.

ALDER-BUD GALL.—The gall on *Alnus*, mentioned on p. 81 of your last number, is probably the one described by me on p. 198 of vol. i. of the Monographs on N. A. Diptera, under the name of *Cecidomyia serrulutæ*. I obtained at that time the perfect insect.—R. OSTEN SACKEN, New York, April 22, 1869.

A CURCULIO NEW TO CANADA.—In the *Canada Farmer* for March, 1869, page 98, mention is made of the capture, in July, 1868, of a specimen of *Lixus concavus*, Say, by Mr. J. M. Bristol, of Virgil, County of Lincoln, Ont. A pair of specimens of this insect were sent us last year by Mr. James Angus, of West Farms, N. Y., but it was not known before to occur in Canada. The following is Mr. Say's description (Ent. Works, vol. ii., p. 275):—

"*L. Concavus.*—Base of the thorax and of the elytra with a common dilated indentation. Inhabits Indiana.

"Thorax convex each side, much contracted before, with very small punctures; dorsal indentation obsolete near the anterior margin and in the middle, profound at base: elytra with regular punctured striæ, not rugose; base with a dilated common deep indentation equalling that of the thorax, and another smaller indentation on the middle of the base: thighs unarmed. Length over half an inch.

"Common, and is the largest species that I have met with in this country. The hair of the body detains a yellowish ferruginous dust, which often gives the whole insect that color."

EXCHANGES.

LEPIDOPTERA. Of Northern United States in exchange for those of the Southern United States, Canada, East Indies and South America. Correspondence also solicited. W. WEBSTER BUTTERFIELD, M. D., P. O. Box 111, Indianapolis, Indiana, U. S.

LEPIDOPTERA.—Of Pennsylvania, in exchange for those of Canada.—F. M. YEAGER, Reading, Pa., U. S.

LEPIDOPTERA.—I am very anxious to secure a correspondent in Canada who would give me in exchange Lepidoptera (Rhopel. et Heteroc.) from Canada, Labrador, and British America generally, for some from Penn., Virginia, Georgia, Florida, California, Europe, S. America, etc.—HERMAN STRECKER, Box 111, Reading, Berks Co., Penn., U. S.

EUROPEAN DIPTERA.—A large collection has been entrusted to me, which will be exchanged for American Diptera, Orthoptera, Hymenoptera, Coleoptera and Lepidoptera; preference given to the orders in the sequence named.—Rev. C. J. S. BETHUNE, Credit, Ont.

EPHEMERIDÆ.—An English Entomologist studying this tribe thoroughly, earnestly desires American specimens, for which other English insects will be given.—Address EDITOR CAN. ENTOMOLOGIST, Credit, Ont.

HYMENOPTERA.—Now that the collecting season has begun again, we beg to remind our readers that Mr. E. T. Cresson, of Philadelphia, is desireus of obtaining specimens of Canadian Hymenoptera. He will gladly determine specimens for any one who will send a duplicate set, numbered to correspond with their cabinet specimens, to the care of JOHNSON PETTIT, Esq., Grimsby, Ont.

BOOKS RECEIVED.

First Annual Report on the Noxious, Beneficial, and other Insects of the State of Missouri. By Charles V. Riley, State Entomologist. Jefferson City, Mo., 1869. (Price $1, plain plates; $2 colored.)

We gladly notice the receipt of this excellent Report, which is of interest and value not only to farmers and gardeners, for whose especial benefit it is prepared, but also to all who study the ways and doings of insects. We may

particularly call attention to the chapter on Cut-worms, in which is related the natural history of twelve species, some of them new to science ; the account of new Grape insects, and various other species, described now for the first time. The work is illustrated by nearly 100 wood-cuts, and two full-page plates ; and bears testimony throughout to the faithful and painstaking labors of the author both in the field and in the study. The Legislature of the State of Missouri deserves much credit for its enlightenment in thus fostering the study of practical entomology ; we earnestly trust that our Canadian Government will speedily see the benefit of following so good an example.

Report on the Culture of the Japanese Silk-worm, Bombyx Yama-mai, in 1867-68, in England. By Alexander Wallace, M. D., Colchester, 1869. This pamphlet (fer which we have to thank Mr. W. V. Andrews, the author's New York agent), contains a very full and minute account of Dr. Wallace's experiments in the cultivation of this noted Japanese silk-worm. If patience and perseverance can ensure success, Dr. W.'s efforts ought certainly to be rewarded by freedom from failure ; such, however, we gather from his Report, has not yet been the case, though he has attained some success, and has raised a few genuine specimens. Any one interested in the culture of these creatures, or other species of Bombyces, will find very many useful details as to management, food, etc., in this work.

Hardwicke's Science-Gossip : A Monthly Medium of Interchange and Gossip for Students and Lovers of Nature. January to May, 1869. London : R. Hardwicke, 192 Piccadilly. (4*s.* per annum.) An excellent and entertaining periodical, handsomely illustrated ; it is largely occupied with microscopy, but entomology and other branches of natural science receive a due share of attention.

Le Naturaliste Canadien. Quebec, No. 5, April, 1869.

Proceedings of the Boston Soc. Nat. Hist. Vol. xii., April, 1869, pp. 305—400

The American Naturalist. Salem, Mass., Vol. iii., May, 1869.

The American Entomologist. St. Louis, Mo., May, 1869.

The American Agriculturist. New York, May, 1869.

The Canada Farmer. Toronto, April, 1869.

The Maine Farmer. Augusta, Me., March 20, 27, April 3, 10, 17, 24.

The Weekly N. Y. Sun. New York, April 7, 14, 21, 28.

Bulletin of the Museum of Comparative Zoology. Cambridge, Mass., Nos. 1 to 7, 1863-69.

The Butterflies of North America ; with Colored Drawings and Descriptions. By Wm. H. Edwards. Philadelphia : The American Entomological Society, Part 3, December, 1868.

After a long delay—caused, we regret to learn, by the illness and subsequent death of the artist at first engaged upon the plates—another part of this truly magnificent work has been issued. It contains very beautiful and accurate figures of the following species : *Argynnis Monticola*, Behr, taken in California; *A. Halcyone*, Edwards, from Colorado ; *Limenitis Proserpina*, Edw., taken in

the Catskill Mountains; *Lycæna violacea*, Edw., from Virginia, Philadelphia, and London, Ont.; *L. Lygdamas*, Doubleday, found in Michigan, Ohio, Virginia, and through the Southern States; *Thecla tæta*, Edw., first taken by Mr. Saunders, at London, Ont., afterwards in Maine and Western Virginia; *T. Acadia*, Edw., taken in Canada near London, Ont., and in various parts of New England and New York. The promised synopsis of North American species is begun in this part. The price to new subscribers is now raised to $2.50 (U. S.) per part, in consequence of the increased expense of the drawings on stone, and coloring of the plates.

TO CORRESPONDENTS.

SUBSCRIPTIONS RECEIVED.—To Vol. i., from H. S., F. M. Y., Reading, Pa. To end of Vol. ii., from the Soc. Nat. Sci., Reading, Pa.

H. T. S., Lewisham, Eng.—Have sent Nos. 1 and 2, as requested.

F. W., Wanstead, Eng.—C. B. M., part v. received; many thanks; have sent you the numbers so far issued of the *American Entomologist*.

J. M. J., Halifax, N. S.—Thanks for the two papers, just received.

SHEET CORK.—We have still some sheet cork on hand; ordinary thickness, 16 cents per square foot; extra thick, 24 cents.

ENTOMOLOGICAL PINS.—We have ordered 100,000 pins, the same quality as our last supply, which gave so much satisfaction, from W. Klaeger, the celebrated German manufacturer; all sizes from No. 1 to No. 6. We expect their arrival next month, and shall be glad to receive early orders from our readers.

THE CANADIAN ENTOMOLOGIST is published on the 15th of each month by the Entomological Society of Canada. In consequence of the new Postal Law, which requires pre-payment of all Periodicals after January 1, 1869, we are constrained to make a slight change in the rates of subscription as follows:—

To members of the Society, gratis.

To non-members (in Canada) 56 cts. per vol., post-paid; 2 copies to one address, $1.

To subscribers in the United States, 62 cents per volume, free of Canada postage. The ordinary U. S. fractional currency may be sent.

To subscribers in Great Britain. Three Shillings per volume, post-paid. The amount may be sent in stamps.

Extra copies 5 cents each, 50 cents per dozen.

N. B.—Correspondence is invited respecting the habits, localities, occurrence, &c., of insects, as this journal is intended to be a medium for the recording of observations made in all parts of the country; insects for identification will be gladly attended to and returned when desired. Any contributions to the publication fund will be thankfully received and gratefully acknowledged.

The *American Entomologist* ($1) and the *Canadian Entomologist* (56 cents) will be furnished post paid, for one dollar and twenty-five cents ($1.25) per annum.

All communications, remittances and exchanges, should be addressed to

"THE REV. C. J. S. BETHUNE, *Credit, Ont., Canada.*"

The Canadian Entomologist.

VOL. I. TORONTO, JUNE 15, 1869. No. 11.

ENTOMOLOGICAL NOTES.

PAPER NO. VI.

BY W. SAUNDERS, LONDON, ONT.

Pyrameis cardui.—Larva found feeding on thistle, June 15th, full grown. Length 1¼ to 1⅜ inches.

Head black, reddish in some specimens, above sprinkled with fine whitish hairs, and a few small black tubercles.

Body above greyish-brown, variegated with yellow and black. Second, third, fourth, fifth, and terminal segments, black, with many whitish dots. A broken dorsal stripe, white anteriorly; yellow from fifth to terminal segments: second segment without spines but covered with fine whitish hairs; third and fourth segments have four spines each; the others have seven, excepting the terminal ones which have two pairs, one placed behind the other. The spines are much branched and vary in color from yellowish to brownish-white tipped with black; base of spines along sides of body from fifth to twelfth segments of a reddish-orange color. Body thickly sprinkled with fine whitish hairs arising from minute white or yellow dots; a pale yellowish broken stripe on each side close to under surface. Spiracles black, ringed with dull yellow.

Under surface greenish-grey, excepting on second, third and fourth segments where it is dull black. Fifth, sixth, eleventh and twelfth segments with tufts of whitish hairs springing from elevated tubercles. Feet dark brown, slightly hairy; prolegs yellowish grey.

The larvæ of *Cardui* vary very much—one young specimen was entirely black, excepting the dorsal and lateral yellow lines; another, full grown, was black throughout marked with yellow dots and transverse lines between the rows of spines—others with very little black, the yellow predominating, but these have some black about the anterior segments. The ridge of tubercles in which the spines are set is bluish-grey in the more yellow specimens, and the same color intermixed with black in the darker ones. Some of the lighter specimens have the base of nearly all the spines reddish, or reddish-orange; others have this color only on segments from fifth to terminal, one rather dark

specimen had all the spines reddish orange at base, giving the whole body a reddish hue.

These larvæ remained in the chrysalis state eight or nine days. The imago is usually found common throughout July and August, and the larvæ plentiful in September. It is quite likely that this insect may also pass the winter in the imago state, although I have never found it hybernating, or taken it on the wing very early in the season.

Limenitis disippus, Godt.—Larva found feeding on willow, July 24th.

Length one inch and a quarter. Head rather large, flattened in front, strongly bilobed, pale green with two dull white lines down the front and roughened with a number of small green and greenish-white tubercles. Each lobe is tipped with a green tubercle, or short horn, larger than any of the others on head. Mandibles brown, tipped with black.

Body above dark rich green, with patches and streaks of dull white; second segment smaller than head, with many minute whitish tubercles; third segment dull whitish-green, raised considerably above second, with a flat ridge above having a long brownish horn on each side of it, thickly covered with very short white and brown spines; fourth segment about the same size as third, with the same kind of ridge above, with a small tubercle on each side capped with a bunch of short whitish spines; between the ridges on third and fourth segments are two small black dots above. Each segment from fifth to thirteenth inclusive has two tubercles, one on each side, and in a line with the long horns on the third segment, each crowned with a cluster of whitish spines; tubercles on sixth and twelfth segments much larger than the others, those on eleventh and terminal segments next in size, the latter placed on the anal lid and nearer together than those on the other segments—those on the ninth are smallest. Tubercles on seventh, eighth, tenth and eleventh segments with a streak of white at their base; each segment behind fourth, excepting ninth, has several smaller tubercles of a bright blue color. A large whitish patch covers nearly the whole of ninth and parts of eighth and tenth segments, and another of a similar character covers the second, third, and part of the fourth. A white stripe extends along each side close to under surface from fifth to terminal segments inclusive, in which is set a small cluster of whitish spines about the middle of segments from sixth to tenth. On each side of seventh, eighth and tenth segments is an elongated blackish spot, just above and behind spiracles; terminal segment with two dark greenish-brown spots above, anterior to the tubercles. Spiracles rather large, oval, brownish-black.

Under surface whitish-green, with a central dull-white stripe on hinder segments; feet brown, ringed with brownish black; prolegs pale greenish, faintly tipped with brown.

This larva varies somewhat in color, some specimens being of a paler green than that above described. There are two broods of this insect in the season, the larvæ resulting from the eggs deposited by the second brood usually attain to less than half their growth before winter, when they hybernate, completing their growth the following spring.

Limenitis arthemis, Drury.—About the middle of July, 1868, while beating some thorn bushes over an umbrella, I captured a larva closely resembling *Disippus*, in fact I thought at first it was merely a variety of that larva. Upon further examination I suspected it to be distinct, and resolved to describe it, but before an opportunity occurred of doing so it disappointed me by changing to a chrysalis, which in ten or twelve days after produced a beautiful specimen of *Arthemis*

Thecla acadica, Edwds.—Larva found feeding on willow, from 10th to 20th of June.

Length five-eighths of an inch ; onisciform. Head very small, pale brown and shining, drawn within the second segment when at rest.

Body above green, of a moderately dark shade, thickly covered with very short whitish hairs scarcely visible to the unaided eye. Body thickest from third to tenth segments. Dorsal line of a darker shade of green than the rest of body. Dorsal region flat, rather wide, and edged on each side with a raised whitish yellow line, beginning at the third segment, and growing fainter on the twelfth and thirteenth. Sides of body inclined at an almost acute angle and striped with faint oblique lines of greenish-yellow. A whitish-yellow line borders the under surface, beginning at the anterior edge of second segment, and extending entirely around the body to a point opposite the place of beginning. This line is raised in the same manner as that bordering the dorsal ridge. Twelfth and thirteenth segments much flattened, especially the latter.

Under surface similar to upper, and also covered with very short fine hairs —feet and prolegs partake of the general color.

In a younger specimen the head was almost black, with a streak of white across the mandibles. The under side was rather deeper in color than the upper, with a faint bluish tint.

Chrysalis 0.33 in. long ; greatest width 0.15 in., covered with minute hairs, pale brown, with many dots and patches of a darker shade. A dark ventral stripe from seventh to terminal segments, sides of body with four or five short dark lines. The insect remains in the chrysalis state about eight or nine days.

Thecla———?—Larva found feeding on pine, June 27th, 1865, one specimen full grown, another about one-third grown, probably the larva of *Thecla niphon*, Boisd. & Lec.

Length five-eighths of an inch. Head very small, pale brownish-white and shining. Drawn within the second segment when at rest.

Body above green, of rather a dark shade, but with a tinge of yellow; a prominent dorsal crest or ridge from third to tenth segments inclusive, bordered on each side by a bright whitish-yellow line, spaces between segments somewhat depressed. From the line bordering the crest the sides of body incline abruptly downwards to the spiracles where the color is a little paler. Below this the body is somewhat flattened out and bordered on each side from third segment backwards with a bright whitish yellow line. Second segment rather paler than the rest of body with a somewhat polished surface and without markings. The two hinder segments of body are much flattened.

Under surface slightly paler, feet whitish, shining and semi-transparent; prolegs green tipped with whitish.

The smaller specimen differed from the larger only in being paler and duller in color, and having the yellow lines less distinct.

The larger specimen entered the chrysalis state July 3rd, the other somewhat later, but both failed to produce the imago, and finally dried up so much that I was unable to determine with certainty to what species they belonged.

Thecla mopsus, Boisd. & Lec.—On the 18th of May, 1868, while beating some wild cherry bushes on the Port Stanley Railroad track, a short distance from London, I obtained a small Thecla larva which very much interested me. Its length was one-eighth of an inch. Head small, brownish black, drawn within the second segment when at rest. Body above dull rosy red, of a brighter tint along sides, with the edges of the dorsal crest paler. Body sparingly covered with rather long hairs nearly one-sixth of an inch long, most of them curved backwards.

Underside dull yellowish, feet and prolegs of the same color.

On the 26th May it escaped from the box in which I thought it was carefully secured, and I saw it no more. On the 9th of June I visited the same locality and secured a larger specimen. I was uncertain this time as to whether I got it from thorn or cherry, as in the bush I was beating they were both growing close together, most probably it was from the cherry.

Length 0.40 in. Head small, of a shining black color, with a pale stripe across the front just above mandibles; mandibles black; head drawn within the second segment when at rest.

Body above green along the middle segments, deep rose color at each extremity, thickly covered with short brown hairs; second segment rosy above, greenish yellow at sides with an edging of the same color in front; third segment entirely rose colored; from third to tenth segments is a dorsal stripe of rose which is wide on fourth, fifth, eighth, and ninth segments, narrow, almost

linear on the intermediate ones; on the 10th segment the green encroaches on the rose color on sides of body, extending more than half way into the segment; behind the tenth segment the body is rose color with a dorsal streak of a darker shade; the rose color at each extremity is united by a rosy line along each side close to under surface.

Under surface dull green with a yellowish tint; feet and prolegs yellowish-green.

June 24th. The larva was now about full grown. Length 0.70 in., width about 0.20 in.

Head very small, bilobed, black and shining, with a streak of dull white across the front above mandibles; mandibles reddish-brown.

Body above dull green, with a yellowish tint especially on anterior segments, thickly covered with very short brown hairs, scarcely visible without a magnifyer—these hairs arise from small pale yellowish dots which appear slightly raised. A dorsal streak of dark green arising from the internal organs showing through the semi-transparent skin from second to fourth segments inclusive. A patch of dull pink or rose color on anterior segments, faint on second segment, covering but a small portion of its upper surface; nearly covering the dorsal crest on third, and reduced again to a small faint patch on fourth; on posterior segments is a much larger rosy patch, extending from the hinder part of ninth segment to the end of body—the hinder part of ninth segment is merely tinged, on tenth it is enlarged to a considerable sized patch widening posteriorly, and behind this the body is entirely covered with rosy red. The sides of tenth segment close to under surface have a streak of the same color, and there is a faint continuation of this on ninth segment. Second segment smaller than third. A wide dorsal crest or ridge from third to tenth segments inclusive, behind this the body is suddenly flattened, sides of body acutely sloped from dorsal ridge to under surface.

Under surface yellowish green, with a few very fine brownish hairs; feet and prolegs greenish, semi-transparent.

I found that the larva fed readily on plum leaves, indeed seemed to prefer them to cherry, so I reared it on this.

June 29th.—The larva fastened itself to the lid of the box in which it had been fed, changing to a chrysalis July 1st.

Chrysalis described July 3rd. Length 0.45 in., greatest width 0.20 in.

Body pale brown and glossy, with many small dark brown or blackish dots distributed over the whole surface, thicker along the middle above, appearing as a faint imperfect ventral stripe from seventh to eleventh segments; surface thickly covered with very short brown hairs invisible without a magnifyer.

The imago was produced on the 13th of July, a fine female *Mopsus*.

I was much surprised when this specimen proved to be *Mopsus*. Boisdu-

val figures the larva of *Mopsus* green, with four white spots above about third or fourth segment, and some white at sides of terminal segments, all very striking in the figure. He also gives *Eupatorium* as its food plant. My specimen was entirely different from this, either Boisduval's figure is incorrect or the *Mopsus* of the south is distinct in its larval state from that of the north.

Thecla—— ? (probably *calanus*, Hub.)—Larva found feeding on oak from 6th to 22nd June.

Length 0.60 in. Head small, rather flat, bilobed, of a shining brownish-black color with a pale streak down the middle, and a line of white across mandibles above; mandibles black; head drawn within the second segment when at rest.

Body above dull greenish-brown with a slight reddish tint, thickly dotted with minute black points invisible to the naked eye, from some of which arise short black or brownish hairs, most numerous about the extremities and around the edge of body close to under surface. Dorsal region flattened above, with a slightly raised line on each side of a paler reddish-brown, edged without from fifth to ninth segments with greenish-grey; a dorsal band of darker brown, enlarging to an indistinct patch at each extremity, most prominent on hinder segments, and having a series of spots along its centre from fifth to ninth segments inclusive, of dull greenish grey, the hinder ones being almost diamond shaped; spaces between segments slightly paler. The sides of body incline abruptly, and are striped with faint oblique lines of dull greenish-grey. Second segment dull greenish, with many short brown hairs. Close to under surface the larva assumes a reddish brown tint, bordered without by a raised line of dull yellowish or greenish white, extending from the anterior portion of third segment all around the hinder part of body to a corresponding place on the opposite side.

Under surface pale dull green, with a slight bluish tint, and a few short hairs along each side; feet pale brown and shining; prolegs greenish, semi-transparent, faintly tipped with brown.

June 27.—Larva fastened itself up to lid of box in which it was confined, and completed its change on the 29th.

July 3.—Chrysalis. Length 0.40 in., greatest width 0.15 in.

Body dull yellowish brown, slightly glossy, with many streaks and dots of a darker shade of brown; a dull ventral stripe formed of these spots extends from 8th to 11th segments inclusive; a short streak of dark brown down the middle of anterior segments; body thickly covered with very fine short brownish hairs, invisible without a magnifyer.

More than two years ago I became firmly convinced that the species now known as *T. calanus* was distinct from *falacer* as figured by Boisduval, with which it had hitherto been confounded; and communicated my views on this

point several times to W. R. Edwards, Esq., and proposed for the species the name *Edwardsii*. A description in manuscript was prepared and read before the London branch of the Entom. Society of Canada. Being persuaded that the larva above described belonged to this insect, I delayed publishing it in hopes of rearing the larva so as to give its complete history. I have taken specimens of the larva for the last three seasons, but have failed each time in bringing them to perfection. One year I had a very fine specimen, which entered the chrysalis state, but while still fresh another larva ate a hole in its side. A second season all my specimens became diseased and dried up, although great care was taken of them. Last pear I succeeded in bringing two into the pupa state, and thought, now, surely the problem will be solved, but no! Days and weeks passed away and the imago failed to appear. Thinking it possible that some specimens might be delayed in their development a season they were kept over until a few days since, when I concluded to carefully dissect one to see if the species could be made out. On lifting a small piece of the enclosing shell a number of minute living ichneumons escaped from the orifice. On examination the second specimen was found similarly infested. I hope to succeed better during the present season.

Of late Mr. Grote has determined beyond doubt that the *falacer* of Boisduval's plate is distinct from that of his text, or that his text is mainly founded on a species distinct from the plate, the *Thecla calanus* of Westwood, which is identical with the insect for which I had proposed the name of *Edwardsii*. Canadian collectors for whom I have named specimens will please bear in mind that the name *falacer* must be dropped and *inorata*, G. & R., substituted for it, and *Edwardsii* changed into *calanus*, West.

Thecla strigosa, Harris.—Larva found feeding on thorn *(cratægus)* June 13th, 1866. Length 0.55 in., onisciform.

Head small, greenish, with a faint tint of brown, glossy, with a black stripe across the front below the middle, and a patch of white between this stripe and the mandibles; mandibles brownish-black.

Body above rich velvety green, with a yellowish tinge, slightly paler between the segments. A dorsal stripe of a darker shade, centered along the middle segments with a faint yellowish line. Anterior edge of second segment yellowish-brown, with a few dots of a darker shade. Body thickly covered with minute brown hairs scarcely visible to the unaided eye. Dorsal crest not bordered with yellow as in *acadica;* sides of body abruptly inclined and striped with faint oblique lines of yellowish, two or three on each segment. The two last segments have a patch of yellowish on each side, making the dark dorsal line appear more prominent. A faint yellowish line close to under surface, from fifth to terminal segments; spiracles pale red, not prominent.

Under surface bluish green, with a darker patch on last two segments ; feet whitish, semi-transparent ; prolegs bluish green.

The change to chrysalis took place June 19th. Length of chrysalis 0.35 in.; widest on anterior portion of seventh segment. Head case rounded. Body dark reddish-brown with black markings, thickly covered with fine short whitish hairs, most numerous on anterior and posterior segments ; anterior segments with many thickly set patches of blackish ; a dark ventral line from sixth to twelfth segments.

This larva very closely resembles that of *Acadica*.

Lycæna neglecta, Edwds.—Larva found feeding on Dogwood *(Cornus—?)* July 12th. Fed it afterwards on willow, which it readily ate.

Length 0.45 in., somewhat onisciform, distinctly annulated. Head small, dark shining brown, with a black streak down the middle, widening as it approaches the mandibles ; mandibles brown, with a streak of a paler color above across them; head drawn within the second segment when at rest.

Body above dull greenish white with a faint tinge of yellow ; second segment has a deeper shade of green, with a blackish line across its posterior edge where it joins the third segment ; a dorsal line of a slightly darker brownish shade ; a dull green band across anterior portion of fifth segment, and another in the same position on eleventh ; on each side of each segment, from fifth to eleventh, is a spot of the same hue extending obliquely backward. Dorsal crest of a whiter shade than the other portions of body ; sides of body slope abruptly, widening considerably at the base. Entire upper surface covered with minute dots from which arise very short fine hairs invisible without a magnifyer, but giving the surface a downy appearance. Twelfth and thirteenth segments much flattened.

Under surface similar in color to upper, with the same downy look ; feet faintly brown , prolegs partake of the general color.

A very young specimen was decidedly yellow, with the darker markings scarcely apparent. A second pale green, with scarcely any markings. A third about the same size of a much deeper green, strongly marked with dark green as in the full grown specimens, but more distinct.

The chrysalis I failed to note, also the duration of the pupa stage.

Hesperia —. Larva, probably *Thanaos*, found feeding on hazel, July 31.

Head large, dull red, slightly bilobed, each lobe pointing above and tipped with reddish-orange; a spot of the same hue just above mandibles, and another midway between these, forming a row of three on the outer edge of each side of the head.

Body above dull whitish-green, covered with minute dots of a whitish or greyish-white color ; a lateral stripe of pale yellow or whitish yellow, becoming linear on anterior segments and terminating on the anterior edge of thirp

segment; anterior edge of second segment, immediately behind the head, ringed with black. Body thickest in the middle, much smaller at second and third segments.

Under surface slightly darker than upper; feet and prolegs of the same hue. This larva I failed to rear.

Several years since I found on the wild columbine *(Aquilegia Canadensis)* a somewhat similar larva belonging to a distinct but allied species. I found several of them on the same plant. They had drawn the leaves together and fastened them with silken threads, forming a rude case, in which they secreted when not feeding. An unfortunate accident destroyed them after they had changed to pupæ, along with the description I had made of them, and I have not met with a similar specimen since,—possibly they may have been the larvæ of *Persius*.

NOTE BY ED. CAN. ENT.—For various reasons—especially that Mr. Saunders' observations on the larvæ of Butterflies might be in the hands of entomologists as early in the season as possible—we have devoted the whole of this number to the conclusion of his valuable Notes, and have been consequently obliged to defer other matter till next month.

THE BUTTERFLIES OF NEW ENGLAND.

The notice in our last number of Mr. Scudder's promised work on New England Butterflies, has already brought many welcome responses. A number of living butterflies have been sent in cotton wool, and although a day upon their journey, were received alive and in good condition: those who live near Boston might try this method, but we think that most persons would be interested in raising the larvæ themselves. In attempting to obtain eggs for this purpose, it is better not to select the freshest butterflies, as their eggs will often prove undeveloped, or at least unimpregnated. It should also be remembered that the males usually appear about a week before the females, and experiments would therefore be more likely to succeed if made about a fortnight after the species is first observed.

In answer to repeated enquiries, we will state that the males of butterflies may, in general, be distinguished from the females by a series of clasping hooks which protrude from the orifice at the tip of the abdomen; frequently these are effectually concealed by long scales. In a number of families the sexes can be determined by the partially undeveloped condition of the front legs of the male: collectors also know many species by their colors.

The proposed volume will include a history and description of the parasites of butterflies. Dr. Packard has kindly promised his assistance in describing these parasites, and examples of every kind, and in large numbers, are desired. They should be accompanied by specimens of the species infested, and, if

possible, by such as show the mode of attack: the fullest observations on the time and manner of attack, and on the subsequent life of the insects, will be acceptable. All specimens will be returned, when desired, by the end of the year.

Complete lists of the butterflies found in different localities, both in New England and the adjacent regions, are wanted, and especially if accompanied by careful memoranda of the exact times of the first appearance, and of the duration of each species. It will be necessary to receive insects from every possible quarter, to arrive at a definite knowledge of their habits. To secure this more effectually, Mr. Scudder will name any local collection of butterflies sent to him with notes, at the Boston Society of Natural History, about the first of October: such collections would be returned before the 1st January. For the safety, however, of his own collection, and of others entrusted to him, it will be necessary to return at once, unnamed, any collection showing traces of having been previously attacked by museum pests.

As stated last month, the amplest credit will be given in the work for every item of scientific intelligence received. We urge our readers to assist in this undertaking to the extent of their ability. With such material aid, the volume cannot fail to supply a need which has long been felt.—*American Naturalist.*

Larva of Melitæa Phaeton.—Mr. W. H. Edwards, of Coalburgh, West Va., writes us that he has obtained the larvæ of *M. phaeton*, feeding, May 20, on the leaves of *Chelone glabra*, L., (the plant was determined by Mr. B. Billings, of Ottawa, Ont).

BOOKS RECEIVED.

The Coleoptera of the Island of Montreal. By A. S. Ritchie. (Reprinted from the "Canadian Naturalist and Geologist.")

After some preliminary remarks on classification, and on the habits of the leading families of Coleoptera, the author gives a valuable synonymical list of the species of this order taken on the Island of Montreal. It comprises 27 families, 183 genera, and 217 species, and is a useful contribution to our knowledge of the distribution of species in this country. We observe a few species not on our list, while many of those common in the Upper Province are conspicuous by their absence.

List of Hymenopterous and Lepidopterous Insects collected by the Smithsonian Expedition to South America, under Prof. J. Orton. By A. S Packard jr., Salem, Mass.

Le Naturaliste Canadien. Quebec, No. 6. May, 1869.

Proceedings of the Boston Soc. Nat. Hist. Vol. xii., pp. 401–419, completing the volume.

The American Naturalist. Salem, Mass., Vol. iii., June, 1869.

The American Entomologist. St. Louis, Mo., June, 1869.

The American Agriculturist. New York, June, 1869.

The Canada Farmer. Toronto, May, 1869.

The Weekly N. Y. Sun. New York, May 5, 12, 19, 26; June 2, 9, 1869.

A Guide to the Study of Insects. By A. S. Packard, jr. Part vii. April, 1869. This part concludes the Diptera and begins the Coleoptera.

The Canadian Entomologist.

VOL. I. TORONTO, JULY 15, 1869. No. 12.

OUR NEW VOLUME.

Very nearly a year has now gone by since the CANADIAN ENTOMOLOGIST was ushered into existence, and it has at length safely arrived at the close of its first volume. Of infantile dimensions it has crawled along through the months of babyhood, at times putting forth a little more strength and marks of growth, until now it feels able to stand upon its feet and assert its intention of living and growing, even though it may but toddle along, for a little time longer. Of course with an increase of size, it will display an enlarged appetite, not only for scientific and literary contribution, but also for the baser, but by no means less essential, sustenance of dollars and cents. We have, therefore, to announce that the price of this publication will now be raised to ONE DOLLAR per annum, in advance; Members of the Entomological Society of Canada, will still receive their copies gratis; the number of pages will also be increased from eight to at least twelve, and if sufficiently encouraged to sixteen.

We take this opportunity of tendering our best thanks to our many friends and correspondents for the kind encouragement, both in word and deed, that they have afforded to what appeared a presumptuous undertaking, and we earnestly hope that they will continue their valuable assistance during the time to come.

ENTOMOLOGICAL NOTES.

DESCRIPTIONS OF FOUR NEW SPECIES OF CANADIAN HYMENOPTERA.

BY E. T. CRESSON, PHILADELPHIA, PA.

GENUS EUCEROS, GRAV.

EUCEROS CANADENSIS, n. sp.—Female. Shining: head yellow, two spots behind antennæ, confluent with a mark on vertex covering ocelli and occiput, and tips of mandibles, black; antennæ black, palish at base beneath; thorax black, lateral margin of mesothorax in front of tegulæ, two lines on disk, a

spot on each side before scutellum, a broad V-shaped mark on scutellum, apex of metathorax, which has two black spots above, anterior margin of prothorax, a spot on each side of pleura, and the tegulæ, yellow; wings hyaline, dusky on apical margin; legs yellow, anterior coxæ in front, posterior coxæ, their femora except base and apex, and their tibiæ except base, black, their tarsi except tips, fuscous; abdomen yellow; a triangular mark on each side of first segment, a transverse mark on each side of second and third segments, dilated laterally, and the remaining segments, except medial spot at tip of fourth segment, and another on extreme tip of abdomen, blackish; venter entirely yellow.—Length, 5¼ lines.

Hab.—Grimsby, Ont. Johnson Pettit, Esq., (Coll. Am. Ent. Soc.) One specimen.

EUCEROS COUPERII, n. sp.—Male. Shining; head yellow; extreme tips of mandibles, spot on vertex covering ocelli and occiput, black; antennæ fulvous, basal half fuscous within, scape black beneath, first eight joints of flagellum with a pale medial stripe, the dilated portion with a pale posterior margin; thorax black, two parallel stripes on disk of mesothorax, interrupted anteriorly, the lateral margin, broad in front, scutellum except sides and an acute mark at base, postscutellum, sides and apex of metathorax, pleura except a line beneath wings, and the tegulæ, yellow; wings hyaline, irridescent, apex fuliginous, legs yellow, posterior coxæ except tips and beneath, their femora except base and apex, and their tibiæ except base, black; abdomen ferruginous, basal segment yellowish, with a large triangular blackish mark on each side; remaining segments have each a small, lateral black spot.—Length, 3½ lines.

Hab.- Ottawa, Ont. (Coll. Wm. Couper, Esq.) One Specimen.

EUCEROS BURRUS, n. sp.—Female. Rufo-ferruginous, opaque; head black; orbits white, interrupted behind; spot on middle of face, clypeus and mandibles, pale fulvous; antennæ fulvous, scape blackish; prothorax, pleura beneath, and sutures of thorax, black; anterior and posterior margins of prothorax, and the tegulæ, white; legs entirely ferruginous, tarsi paler; wings hyaline, irridescent; abdomen shining at base and apex.—Length, 3 lines.

Hab.—Ottawa, Ont. Wm. Couper, Esq., (Coll. Am. Ent. Soc.) One specimen.

Of this interesting genus (in which the antennæ of the male are broadly dilated and much flattened about the middle), there are seven species known to me as occurring in North America. They may be recognized by the following characters:

Thorax black and yellow:

Abdomen above black, banded with yellow; posterior legs black and yellow,

1. CANADENSIS, female.

Abdomen above rufous, basal segment black on each side; posterior legs black and yellow.....2. COUPERII, male.

Abdomen above fulvous, varied with yellow; posterior legs fulvous and yellow, 3. THORACICUS, male.

Thorax above rufous:

Abdomen entirely rufous; most of head and pleura beneath black; legs and antennæ fulvo ferruginous.....4. BURRUS, female.

Abdomen rufous, first three segments narrowly yellowish at tip; most of head, antennæ except tips, posterior tibiæ, and tarsi at base, and lateral sutures of abdomen, black.....5. FRIGIDUS, female.

Thorax above honey-yellow:

Abdomen above honey-yellow, with large medial, transverse, yellow spots; thorax vittate with yellow; antennæ fuscous, pale at base.....6. MEDIALIS, female.

Abdomen entirely pale honey-yellow; most of head and antennæ of female black. 7. FLAVESCENS, female, male.

Nos. 1, 2 and 4 are from Canada; 3 from Connecticut; 5 from Maine; 6 from Massachusetts; and 7 from Connecticut and West Virginia.

GENUS MENISCUS SCHIODTE.

MENISCUS BETHUNEI, n. sp.—Female. Shining black; orbits, face except central black ridge, clypeus, mandibles except tips, annulus on antennæ, hooked mark on each side of mesothorax, anteriorly, two short, nearly confluent lines on the disk, scutellum except central black line, three spots at base of methorax, a transverse line at tip and spot on each side, three spots on pleura, and triangular mark beneath just in front of middle coxæ, base of first, second and third abdominal segments, and the venter, white; antennæ long and slender; wings hyaline, irridescent, apex faintly dusky; legs honey-yellow, coxæ paler beneath, posterior tibiæ black, base pale honey-yellow, extreme base of their tarsi black, remainder yellowish-white; claws pectinated; metathorax opaque; abdomen polished.—Length 4½ lines.

Hab.—Credit, Ont. Rev. C. J. S. Bethune. (Coll. Am. Ent. Soc.) One specimen.

NOTES ON THE LARVA OF PYRAMEIS HUNTERA, SMITH.

BY W. SAUNDERS, LONDON, ONT.

Several years ago my esteemed friend, Mr. D. W. Beadle, of St. Catharines sent me specimens of this larva, which he had taken feeding on some species of *Gnaphalium*. No description was then taken, and the larva was not met with again until the present season, when I found it on the G. W. R R. track, a mile east of London, feeding on *Gnaphalium polycephalum*. It had drawn the leaves together, and fastened them into a rude case with silken threads. The larva during its growth had consumed portions of the inner surface of the

leaves, especially near their summit, and hence, here the foliage was crisp and blanched. These whitened portions of the leaves, together with the size of the case occupied by the larva when full grown, enables the collector readily to discover their places of retreat.

On the 21st of June, I took three of them, two small and one full-grown; each small one occupied the tip only of a leaf, the edges of which were drawn together and fastened with silken threads.

Description of full-grown specimen:—Length, 1.20 inches. Head, medium sized, bilobed, flat in front; black with a number of short, fine, pale brownish hairs.

Body above *alternately banded with rich, blackish purple, and yellowish green.* The purple bands occupy the middle portion of each segment, and on these arise transverse rows of black branching spines—none on second segment—four spines each on third, fourth, and terminal segments—seven on each of the others. *On each side of the dorsal line, from sixth to twelfth segments inclusive, is a round silvery white spot*, set on the anterior edge of the purple bands. The bands of yellowish green, which alternate with those of purple, are crossed by faint transverse lines of black—anterior edge of second segment brown—posterior portion, yellowish green crossed with faint black lines; there is also a fringe of whitish brown hairs, arising from small black tubercles crossing this segment just beyond the middle. Spiracles large, dark brown, encircled with white.

Under surface dull purplish brown, with many very small dots of yellowish green—feet, black—prolegs, purplish brown.

Description of small specimen:- Length, 0 25 in. Head, medium size, black and shining.

Body above, dull reddish brown, and glossy, spines black, as in full-grown larva. Under a magnifying power of 45 diameters, the white spots are very distinct, but are scarcely perceptible with an ordinary magnifying lens.

Under surface similar to upper—feet, black.

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

CICINDELIDÆ.

CICINDELA, *Linn*
Sexguttata, *Fab.*
Limbalis, *Klug.*
Purpurea, *Oliv.*
Vulgaris, *Say.*
Duodecim-guttata, *Dej.*
Repanda, *Dej.*
Punctulata, *Fab.*

CARABIDÆ

OMOPHRON, *Latr.*
Americanum, *Dej.*
ELAPHRUS, *Fabr.*
Cicatricosus, *Lec.* 1
Ruscarius, *Say.*
LORICERA, *Latr.*
*Neoscotica, *Lec.* 2
NEBRIA, *Latr.*
Pallipes, *Say.*
NOTIOPHILUS, *Dumeril.*
*Semistriatus, *Say.*
Sibiricus, *Motsch.*
CALOSOMA, *Fabr.*
Scrutator, *Fabr.*
*Willcoxi, *Lec.*
Frigidum, *Lec.* 3
Calidum, *Fab.*
CARABUS, *Linn.*
Limbatus, *Say.*
*Sylvosus, *Say.* 4
UTCHRUS, *Fab.*
Lecontei, *Dej.*
*Brevoorti, *Lec.*
DYSCHIRIUS, *Bon.*
Globulosus, *Putz.*
CLIVINA, *Latr.*
Rufescens, *Dej.* 5
Cordata, *Putz.*
SCHIZOGENIUS, *Putz.*
*Lineolatus, *Say.* 6
BRACHINUS, *Web.* 7
*Americanus, *Lec.*
Ballistarius, *Lec.*
Fumans, *Fab.*
Cordicollis, *Dej.*
GALERITA, *Fab.*
Janus, *Fab.*
CASNONIA, *Latr.*
Pensylvanica, *Dej.*
PLOCHIONUS, *Dej.*
*Timidus, *Hald.* 8
LEBIA, *Latr.*
Atriventris, *Say.*
*Viridipennis, *Dej.*
Viridis, *Say.*
Pumila, *Dej.*
Scapularis, *Dej.*
LEBIA, *Latr. (continued).*
Axillaris, *Dej.*
Fuscata, *Dej.*
DROMIUS, *Bon.*
Piceus, *Dej.*
APRISTUS, *Chaud.*
*Subsulcatus, *Chaud.*
METABLETUS, *Schmidt.*
Americanus, *Schaum.*
BLECHRUS, *Motsch.*
*Linearis, *Schaum.*
CYMINDIS, *Latr.*
Reflexa, *Lec.*
Pilosa, *Say.*
Americana, *Dej.*
*Neglecta, *Hald.*
AXINOPALPUS, *Lec.*
Biplagiatus, *Dej.*
CALLIDA, *Dej.*
Punctata, *Lec.*
CALATHUS, *Bon.*
Gregarius, *Say.*
*Opaculus, *Lec.*
Impunctata, *Say.*

(To be Continued.)

MISCELLANEOUS NOTES.

CAPTURES.—On June 23, while walking on William Street, Toronto, I captured a fine specimen of *Parenthos nubilis;* not having a box I was compelled to imprison it in a roll of paper. Just as I got to Yonge street, out got my friend, and it was not until after a long and exciting chase that I finally

* Species marked with an asterisk have not been before included in the list of Canadian Coleoptera.

1 Found under moss and bark of old logs in swamps.

2 A single specimen picked up on the shore of Lake Ontario.

3 Not uncommon on trees, where it feeds upon the canker-worm.

4 Taken in August and September under logs in open woods.

5 Under bark o old logs.

6 Occurs under stones at the margin of a creek.

7 The species of *Brachinus* are inserted with some diffidence, as Dr. Horn is now preparing a revision of the genus, and has a number of the writer's specimens under consideration.

8 Under bark of maples in winter.

secured it in a doorway, much to the astonishment of the surrounding public, who evidently thoght me an escaped lunatic, and did not seem one whit the wiser when I informed them of the name of my prise. I also took recently a specimen of that pretty and rare beetle *Gnorimus maculosus*.—E. B. REED, London.

LONDON BRANCH.—You will be glad, Mr. Editor, to learn that Entomology is still progressing with us, and that it has lately obtained a start in a fair and fresh field. The Head Master of Hellmuth College, the Rev. A. Sweatman, has procured a cabinet for the school, and is giving every encouragement to the boys to take an interest in the science; and a New York gentleman, Mr. Gordon, the father of one of the pupils, has very liberally offered two prizes for the best collection of specimens procured during the holidays, and to be presented to the College cabinet.—E. B. REED, London, Ont.

BOOKS RECEIVED.

The Lepidopterist's Guide, intended for the use of the Young Collector, containing full instructions for the Collecting, Management, Observation, and Preservation of Lepidoptera, in all their stages. By H. Guard Knaggs, M.D., F. L. S. London: Van Voorst, Paternoster Row, E.C. (Price, 1s. 6d. stg.)

We have, time and again, recommended our readers and correspondents to procure Dr. Packard's *Guide*, and we hope that most of them have invested in it by this time: we now advise such of them as collect Lepidoptera to lay out a little more of their hard cash in the purchase of Dr Knaggs' *Guide*, for though both are 'guides,' and trustworthy ones too, they do not pull in opposite directions, but lead the faithful follower to a very fair knowledge of Entomology. The work before us, whose title we have given in full above, while modestly put forth as for the use of *young* collectors, is one from which very few old hands would not learn a good deal well worth knowing: it is, indeed, if not the best, at any rate one of the best, manuals of practical instruction in a particular branch of natural history that has ever been published. Full and clear instructions are given for first getting hold of and then looking after and taking care of Lepidoptera in every stage of their existence, from the new laid egg to the perfectly developed fly. From being a book of *instructions*, some may think that it must be a pretty dry sort of affair—like, for instance, the drill books at the Military School—but we can assure them that it is quite the reverse, being really most interesting and amusing; some parts of it would even entertain the only too numerous individuals who do not know a bug from a butterfly!

Proceedings and Traniactions of the Nova Scotian Institute of Natural Science. Vol ii., part ii., 1867-8. Halifax, N. S. : W. Gossip.

We cannot but congratulate our Sister Province, far away by the sea, on its enterprising and valuable Institute of Natural Science, which, judging from its published transactions, and the interesting newspaper reports of its meetings, is doing a good and useful work. The volume before us, though certainly rather late in its appearance, contains many valuable and interesting papers on various branches of natural science, especially on the marine fauna and mineralogy of the country.

Address to the members of the Tyneside Naturalists' Field Club. By the President, the Rev. Angus Bethune, M. A., delivered at its 22nd Anniversary Meeting.

INDEX TO VOL. I.—We purpose issuing a title page and index to the first volume of the *Canadian Entomologist*, which this number completes, with our issue of next month, the first of the new volume.

Hardwicke's Science Gossip. London, Eng., June and July, 1869.

Newman's Entomologist, No. 66. From Mr. Reeks.

Le Naturaliste Canadien. Quebec, No. 6, June, 1869.

The American Agriculturist. New York, July, 1869.

The American Entomologist. St. Louis, Mo., July, 1869.

The Canada Farmer. Toronto, June, 1869.

The Maine Farmer. Augusta, Me.

The Weekly N. Y. Sun. New York.

DONATIONS.

We beg to acknowledge with grateful thanks the following donations to the Entomological Society of Canada :—

To the *Publication Fund*, the sum of two dollars from W. Saunders, Esq., London, Ont.

To the *Library*, ten octavo and six quarto pamphlets, from J. L. LeConte, Esq., M.D., Philadelphia, containing a large number of his valuable monographs and papers on Coleoptera, published in various scientific periodicals. A most useful and acceptable addition to the Library of the Society.

TO CORRESPONDENTS.

SUBSCRIPTIONS RECEIVED.—To Vol. I, from J. M. C., Newport, Vt. (Your letter of *April* 16 did not reach us till *June* 17! Have sent back Nos. and ordered *Am. Ent.* for you.) To end of No. 9, Vol. II. from T. L. M., New York. To Vol. I., from Dr. W. W. B., per Studley & Co.

EXCHANGES.—The Rev. F. O. Morris, Nunburnholme Rectory, Hayton, York, Eng., writes that he sent in March last a box of British insects to Dr. Butterfield, of Indianapolis, Ind., per the Smithsonian Institution, but has since heard nothing further respecting them; he now desires to know whether Dr. B. ever received them or not, and if so, begs him to return the box full of American specimens, and he will send it back again with a fresh lot of British ones.

[We have recently been informed that Dr. B. has removed to Sancta-Clara-on-Guadalupe, California, and probably has not received the specimens, as the Smithsonian Institution only makes distributions of packages at certain periods of the year.—ED. C. E.]

J. P. B. H., Boston, Mass.—Have written to the author for the information you desired.

F. W., Wanstead, Eng.—C. B. M.. Lep Heteroc., parts xvi., xviii., and xix., received; very many thanks. The following are the new species described in Riley's First Report:—Lepidoptera, *Agrotis, Cochranii, A. scandens, Penthia vitivorana*, Packard; *Aplodes rubivora, Pempelia grossulariæ*, Packard; *Anchylopera fragariæ*, Walsh & Riley; *Gelechia gallæ-solidaginis, Pterophorus carduidactylus;* Coleoptera, *Madarus vitis;* Diptera, *Lydella doryphoræ, Pipiza radicum, Anthomyia zeæ;* Homoptora, *Eriosoma ulmi;* Hymenoptera, *Eurytoma Bolteri, Hemiteles? Cressonii, Microgaster gelechia.*

EXCHANGE.

HEMIPTERA.—I should be glad to make exchanges with any one collecting Hemiptera—an order that has hitherto been much neglected in this country—or to give an equivalent in other orders for species from different parts of Canada.—JOHNSON PETTIT, Grimsby, Ont.

ENTOMOLOGICAL PINS.—The supply of pins has not yet arrived, but they are now on the way, and we expect them daily. We shall fill the orders we have received immediately upon their arrival. We cannot tell the exact price till we get the invoices.

TERMS OF SUBSCRIPTION to Vol. ii:—

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All communications, remittances and exchanges should be addressed to

"THE REV. C. J. S. BETHUNE, *Credit, Ont., Canada.*"

THE CANADIAN

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VOLUME II.

EDITED BY

THE REV. C. J. S. BETHUNE, M.A.,

SECRETARY TO THE ENTOMOLOGICAL SOCIETY OF CANADA.

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LARVA INVESTING THE PARSNIP.

(Depressaria Ontariella, n. sp.)

BY THE EDITOR.

Last year our bed of garden parsnips turned out so badly in consequence of the protracted drought of the season that most of them were not worth digging; thinking, however, that we might as well get some seed from them as they were a good variety, we left them where they were for the winter. When spring came they looked beautifully fresh and green, and soon grew most luxuriantly, sending up tall stems and producing huge umbels of flowers. There was a grand prospect of a fine crop of seed, and we began to promise supplies of it to some of our neighbors, who complained that their's was not satisfactory,—all, indeed, looked fair and promising till the last week in June, when "a change came o'er the spirit of our dream!" The fine umbels of flowers began to look rather unhappy. Decidedly *seedy* in one sense, but by no means "seedy" in another. Webs appeared over them, tiny caterpillars were seen to be thick about them, and very soon the big umbels were contracted into shapeless masses of web and excrement, the flowers were all eaten up, the prospect of seed was utterly and entirely gone! After the flowers were all consumed, some of the more juvenile caterpillars tried the uppermost green leaves, but not finding them to their taste they soon left them, and followed the example of the seniors, who had burrowed into the hollow stems, and were quietly eating the soft white lining, out of sight of all their enemies. Most of them entered the stems at the axils of the leaves, but some few burrowed directly into them, making a round hole in the sides. By the 14th of July the majority of them had disappeared inside the stems, and there they lay so thick, some in the larval and some in the chrysalid state, that one could hardly cut a stem in two, at a venture, with a knife, without performing the same operation on a pupa or larva as well. Some of the caterpillars were so unkind as to wander off to a bed of the newly sown parsnips and eat a goodly quantity of them, after having destroyed all our second year's crop; in this case they

seemed to relish the young green leaves, while in the older plants they would hardly touch anything but the flowers and the lining of the stems.

The following is a description of the mature larva :—

Length 0.70 inches. General color dirty green above, yellowish on sides and beneath. Head deep shining black, emarginate posteriorly; second segment with a similarly shining black trapezoidal shield above, divided in the middle by a fine suture, the rest of the segment greenish yellow, with three small black warts on each side ; remaining segments, except the eleventh, dirty green above, yellowish on sides and beneath; eleventh segment entirely dull yellowish ; all the segments, except the first two, have four dorsal, eight lateral (four on each side), and four ventral, shining black warts, each emitting a fine hair, black tipped with white,—some of the ventral warts are absent, while their place is occupied by the feet ; dorsal line dark green, fine, rather indistinct. Legs shining jet black ; prolegs dirty greenish yellow ; three pair of the former, five pair of the latter—sixteen feet in all.

Young larva :—Length 0.30 inches. Similar in all respects to the mature larva, except that the color of the first four segments is rather darker, and of the remainder more yellowish.

Pupa :—Length 0.40 inches ; dark brown, abdomen a little paler ; enclosed in a slight silken cocoon inside the hollowed stem.

The insects remained a fortnight in the pupa state, the moths beginning to appear on the 1st of August. They proved to belong to the genus *Depressaria*, of the family *Gelechidæ*, group *Tineina*. A full description of the characters of this genus is given by the late Dr. Clemens in his article on "American Micro-Lepidoptera," (Proceed. Ent. Soc. Phila., vol. ii., No. 2, page 124). The most striking peculiarities are the indentation of the hind margin of the secondaries toward the anal angle, the brush-like second joint of the labial palpi, and the flattened abdomen with its projecting scales at the sides.

But very few American species of this genus have yet been described, though no doubt many will be found when collectors begin to turn their attention more particularly to the Micro-Lepidoptera ; at present most of us find that we have quite enough to do in trying to investigate the Macros, the field in this department being large enough to occupy the attention of an immensely increased number of Entomologists for years to come. The species before us has evidently not been described by any American writer, nor do we find that it corresponds to the brief description of any of the British species contained in Mr. Stainton's *Manual*. Mr. Curtis relates that *D. applana*, *depressella*, and *daucella*, affect carrots and parsnips in England, but they appear to differ very much from our species.

D. pastinacella resembles ours in color, but the description does not otherwise tally; its food-plant, judging from the specific name, is the same, though no account is given of the larva in any books that we have access to. As then the ravager of our parsnips is in all probability a native and not an imported insect, affecting some wild plant of the same character, we may call it from the name of this Province, *Depressaria Ontariella.*

The following is a description of the imago :—

Depressaria Ontariella, n. sp.—Alar exp. 0.90 inches; length of body 0.40 inch; wings with a satiny lustre. Primaries greyish fuscous, varied with black scales and blotches; a small black spot at the base of the costa; basal third irregularly marked with black spots and blotches, and with a few whitish spots—these vary very much in different specimens; termination of the disk with a whitish spot, partially margined with black; a very much curved transverse fascia composed of parallel longitudinal black streaks, proceeding from the costa and terminating before the hind margin; then a somewhat conspicuous outwardly angulated narrow dusky white fascia, forming a more or less distinct V across the wing; and next an indistinct dusky fascia, a narrow subterminal line, and a terminal row of deep black points. Fringe fuscous, broadly edged with whitish.

Secondaries semi-transparent, whitish, darker towards apex and exterior margin; nervures distinctly marked with dusky scales. Fringe long and dusky, longer and much paler towards the anal angle.

Underside side of primaries dusky, without any markings, except a terminal rim of black points; secondaries much paler, with black points towards the apex on the exterior margin.

Head, thorax and abdomen above fuscous; labial palpi fuscous above, brush of second joint black beneath, third joint black tipped with white; abdomen with a row of black spots along each side.

These moths, or possibly a late brood, though we do not see what a later brood would have to feed upon, hybernate and may often be seen flitting about rooms and emerging from behind curtains even in the depth of winter. They are usually mistaken for clothes-moths, and indeed we always hitherto regarded them as such ourselves, and were immensely surprised when we found them to be the product of our parsnip worms.

As some of our horticultural readers may be troubled with a superabundance of this insect, and be desirous of learning a mode of getting rid of it, we may suggest a remedy. As soon as the young caterpillars appear upon the flowers, dust the umbels well over with powdered white hellebore, and repeat the operation occasionally, as all the larvæ do not

appear at once. Should they escape notice at first, and the flowers be destroyed, cut off and burn the affected stalks before the moth has time to emerge from the pupa, and thus reduce the numbers of the destroyer for the ensuing year. As the caterpillars are very active and wriggle about or drop down upon the slightest disturbance, they may easily be dislodged from their haunts and collected in a pan or sieve, and then burnt in the fire. It is possible that various parasites prey upon these insects, and assist in keeping them in check, though none have as yet been hatched from our specimens. Their numbers in our gardens are, however, being rapidly reduced by a Wood-pecker (*Picus villosus*), who daily visits the parsnip stalks and pegs away with right good will at the larvæ and pupæ within.

ON A SUPPOSED NEW ARCTIAN.

BY W. SAUNDERS, LONDON, ONTARIO.

On the 24th of April, 1868, I found under a log, near the Port Stanley Railroad track, a short distance from London, a young larva of an Arctian, which I supposed to be *Parthenice*, but since it differed slightly in appearance from the young of this species which I had reared before, I resolved to trace its history. In common with other allied species, this had evidently hybernated the winter through in the larva state, and had just awoke from its torpor. The following description was taken at the time of capture :—

Length 0.40 inches ; head rather small, bilobed, black, and shining, with a few short hairs.

Body above, dark brown, with transverse rows of shining black tubercles, from which arise spreading tufts of black hair, a few hairs in each tuft on hinder segments much longer than the others ; a faint dorsal stripe a little paler than general color.

Under surface of the same shade as upper, but a little paler ; 5th, 6th, 11th and 12th segments with a transverse row of tubercles in continuation of those above, with a few short brownish hairs arising from each ; feet brown, banded with black ; prolegs, pale brown.

In common with most other Arctians its appetite was not dainty. It would eat almost any green herb. I fed it on dandelion and lamb's quarters (*Chenopodium album*).

After the next moult, the body assumed a pale dirty brown tint, darker along hinder segments, with tubercles as before ; hairs somewhat shorter ; body strongly annulated. The under surface paler, with a faint reddish tint ; feet black, with bands of yellowish brown.

About the middle of May it moulted again, and on the 18th the following description was taken :—

Length 0.85 in.; head larger in proportion to body than before, not so strongly bilobed, rather flattened in front, deep black, with a few short hairs; palpi dull reddish, tipped with black.

Body above distinctly annulated, of a deep velvety black color, with tubercles as before, hairs much longer, chiefly black, those on hinder segments longer than the others, with a few whitish ones mixed with them. Along each side of body, close to under surface, is a row of tufts of reddish-orange hair.

Under surface dark brown, with a row of tubercles on 5th, 6th, 11th and 12th segments, with short tufts of reddish-orange hair; feet black, with pale streaks; prolegs reddish-orange.

From the 20th May to the middle of June the larva made very little growth, and about the latter date began to contract previous to entering the pupa state. On the 20th of June I observed that it was spinning a light web, and about to undergo its change when another description was taken:

Length 0.80 in.; head medium size, black and shining.

Body above pale brown, with dull black tubercles and spreading tufts of black hairs; a dorsal stripe pale, dull, whitish pink.

Under surface dirty brownish white; hairs on tubercles on 5th, 6th, 11th and 12th segments short, blackish; feet blackish brown; prolegs pale brown and hairy.

On the 22nd of June it changed to a dark brown chrysalis, producing the imago July 6th, which proved to be a female.

ARCTIA BIMACULATA, n. sp.—Expands one inch; palpi reddish; head, antennæ and thorax reddish brown; abdomen stout, dull red with a faint broken dorsal line; body below, brownish red; feet of a little darker shade.

Primaries above *dull reddish brown, with a round white spot within the middle* and just below the median vein.

Secondaries dull red, with a black spot about the middle, and a *wide, irregular band along the hind margin*, extending from the anal angle to near the tip, where there is a small black dot. The hinder part of this band lies close to the hind margin; beyond, it is slightly advanced, having a streak of red between it and the edge; margin edged with a blackish line, fringe reddish.

Under surface of both wings red, of a little brighter shade than secondaries above.

Primaries have a blackish irregular bar across the end of the discal cell and extending a little way above it, near the tip is a brown dot. The white spot above is scarcely produced below, being red, a little fainter than general color.

Secondaries have the same markings as above, the central spot is a little larger and the marginal band narrower, not extending to the hinder edge of wing.

NOTES ON ALARIA FLORIDA, *Guén.*

BY W. SAUNDERS, LONDON, ONT.

In July of last year there bloomed in my garden a fine plant of that variety of evening primrose known as "*Lamarckiana*" (*Œnothera Lamarckiana*). I had been advised by an Entomological friend to procure this flower with the view of attracting moths at night, and found it to succeed admirably. Its lovely yellow petals expand suddenly about seven o'clock every evening, and diffuse a fragrance all around very attractive to Sphingidae and other nocturnal moths. The flowers expand about three inches and are very beautiful; they remain expanded until some time after sunrise the following morning, when they close to open no more. The plant flowers abundantly, fresh ones appearing every evening.

I was surprised at the number of specimens of *Alaria Florida* which were attracted—a charming little moth with the greater part of its fore wings covered with brilliant rosy red. It had always been a rarity with me before, indeed for several years I think I had not met with it at all; but now, night after night I found them hovering around these flowers, and on several occasions found three or four specimens the morning following buried amidst the closing petals.

After a few days I saw no more, but soon observed a smooth green caterpillar feeding on my favorite plant. Not content with eating the leaves only, these marauders had a special preference for the flower buds, eating away into their tender substance and utterly destroying them. It did not occur to me at the time that this might be the larva of *A. Florida*, but so it afterward proved. After killing most of them, several were reserved and fed for some time on the leaves of the plant, after which they changed to pale brown chrysalids. The following is a description of the full grown larva :—

Described July 25th—Length 1.10 inches; cylindrical.

Head rather small, slightly bilobed, pale yellowish green; mandibles tipped with dark brown.

Body above pale green semi-transparent; a dorsal line of a darker green, due to the transparency of skin showing the internal organs; a lateral line of the same shade of color, but fainter; *second segment with a patch of pale dull red on each side;* entire upper surface downy, with very short pale brown and whitish hairs scarcely visible without a magnifier; spiracles pale brown.

Under surface similar to upper, a little darker shade of green prevailing on anterior segments; feet and prolegs green, the latter faintly tipped with brown.

These remained in the chrysalis state during the fall, winter and spring, producing the perfect insect early in July, 1869.

NOTE BY ED.—In July, 1866, and again in the same month of 1868, I had the pleasure of spending a short time at Weston, with the Rev. W. A. Johnson. On both occasions we took a number of specimens of *A. Florida* on the flowers of a variety of Evening Primrose; some were taken at various hours of the night, and others in the morning, entangled in the closing petals; we also found a number of larvæ, similar to those described above, eating into the flower buds, and ruining the beauty of many of the blossoms. I was anxious to trace the history of these caterpillars, fancying they must have some connection with the pretty Alarias, but having no Œnothera plants at home, I thought it was useless trying to rear the larvæ; I am very glad to find that Mr. Saunders has solved the question for us. During my last visit Mr. Johnson gave me an enormously magnified drawing from the microscope of an egg of this insect, which was laid at 4.30 a. m., on the 15th of July, 1868. In shape it resembles an orange, being circularly flattened at the top, and supported at the base on a short stem-like attachment to the flower bud; the sides are slightly crenate longitudinally, and ornamented with minute circular prominences. I have also taken the moth on the flowers of the wild species of Œnothera in this neighborhood, but always in the evening, and during the month of July; this year I have examined numbers of these plants, but have not found a single specimen of the moth or its larva; last year they were tolerably common.

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from Page 107.)

CARABIDÆ.

PLATYNUS, *Bon.*
Hypolithos, *Say.*
Marginatus, *Chaud.*
Sinuatus, *Dej.*
Extensicollis, *Say.*
Decorus, *Say.*
*Moerens, *Dej.*
Melanarius, *Dej.*
*Metallescens, *Lec.*

PLATYNUS *(continued).*
Harrisii, *Lec.*
Cupripennis, *Say.*
Punctiformis, *Say.*
*Subcordatus, *Lec.*
*Vagans, *Lec.*
Retractus, *Lec.*
Ruficornis, *Lec.*
Octopunctatus, *Fab.*

(To be Continued.)

PLATYNUS *(continued).*
Placidus, *Say.*
Obsoletus, *Say.*
Stigmosus, *Lec.*

OLISTHOPUS, *Dej.*
*Parmatus, *Say.*
*Micans, *Lec.*

PTEROSTICHUS, *Bon.*
*Sustentus, *Lec.*

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* Species marked with an asterisk have not been before included in the list of Canadian Coleoptera.

MISCELLANEOUS NOTES.

BUTTERFLIES IN JULY.—The present season, though cool and wet, I have found very much better for collecting Lepidoptera than the two previous hot and dry summers. During the month of July I have captured, or seen, speimens of the following butterflies, although I have had but few opportunities for making anything like an Entomological excursion :—*Papilio turnus, troilus, asterias; Colias philodice; Danais archippus; Argynnis cybele, aphrodite, bellona, myrina; Melitæa tharos; Grapta interrogationis; Vanessa J-album, milberti, progne, antiopa; Pyrameis atalanta, cardui, huntera; Limenitis arthemis, disippus; Neonympha eurythris; Erebia nephele; Thecla inorata; Polyommatus americana; Eudamus tityrus; Hesperia hobomok, Leonardus, Peckii, ahaton.* Twenty-nine species in all. I have no doubt that many of our Canadian collectors have done much better than this, and I trust they will let our readers know it, though I think the above list is not bad for a single month, characterized as it was by so many cold and rainy days. Some species have been excessively abundant; *e. g. C. philodice, D. archippus, V. antiopa, P. cardui;* others unusually numerous ; *e. g. V. milberti, P. huntera* and *atalanta, L. arthemis,* which is usually very rare, *N. eurythris, E. nephele,* and *Thecla inorata.*

On the the 3rd of August, a lovely bright warm morning, after an excessively wet night, I drove about ten miles along country roads. Every few yards there was a patch of mud, the effects of the heavy rain, and at every patch of mud there were from half a dozen to twenty specimens of *Colias philodice,*—at least one, I should think, for every yard of distance that I travelled. I must, then, have seen at a very moderate computation, about 10,000 specimens of this butterfly ! There were also, I should judge, about one-fifth as many specimens of *Vanessa antiopa* flying about, besides numbers of other common butterflies.—C. J. S. B.

TERMS OF SUBSCRIPTION to Vol. ii :—

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The Canadian Entomologist.

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TO THE READER.

In order to enable future volumes of the CANADIAN ENTOMOLOGIST to date their commencement from a less awkward time than the middle of a year, as well as for other reasons that it is needless to specify, we have resolved upon spreading the publication of the current volume over the remainder of this year, and the whole of the following one; we shall thus issue a number about every six weeks instead of monthly, and begin volume three in January, 1871. The following will be the dates of issue of the remaining numbers of this volume, so far as they can be decided upon beforehand:—No. 3 on November 15, 1869; No. 4 on January 1, 1870; No. 5, February 15; No. 6, April 1; No. 7, May 16; No. 8, July 1; No. 9, August 15, No. 10, October 1; No. 11, November 1; No 12, December 1. In accordance with this arrangement, we have delayed the issue of the present number, as will have been observed, from September 15 to October 1. Contributions for publication should be in the hands of the Editor about ten days before the date of issue of a number, in order to secure insertion in it.

ON A SPECIES OF HEMITELES *(Ichneumonidæ)*,

Ascertained by the Editor to be parasitic in Canada on the Imported Currant Worm Fly *(Nematus ventricosus*, Klug.)

BY BENJ. D. WALSH, M. A.

Not a single American species of *Hemiteles*, so far as I am aware, has as yet been described under that generic name as occurring north of the West India Islands. Two of Say's *Cryptus*, indeed, namely *Cr. orbus*, found in Indiana, and *Cr. tenellus*, found in Pennsylvania, manifestly belong to this genus; and the latter may not improbably be identical with our insect, though his description is insufficient to identify it, and scarcely separates it from *Hemiteles thoracicus*, Cresson, an inhabitant of Cuba. In my own cabinet, besides the species that we now have to do with, I have no less than nine undescribed species of this genus that were captured or bred in Illinois. The genus may be conveniently divided into two principal groups, according to the presence or

absence of metathoracic thorns ; and of my undescribed species but two belong to the latter category. In fact it would seem from the following table, that a thorned metathorax is rather a S. A. than a N. A. character.

GENUS HEMITELES.

GROUP A :*Two thorns more or less distinct, one on each side of the metathorax, and directed backwards and outwards.* *H. tricolor*, Brulle, Brazil. *H. fasciipennis*, Br., Brazil, *H. xanthogaster*, Br., Brazil. *H. rufiventris*, Br., S. M. *H. striatus*, Br., Columbia. *H. lepidus*, Br., Brazil. *H. pulchellus*, Br., Brazil. *H. fuscipennis*, Br., Hayti. *H. incertus*, Cresson, Cuba, and two undescribed species from Illinois, U. S. In all 7 S. A., 4 N. A. sp.

GROUP B. :—*Metathorax unarmed.* In all 13 N. A. sp., and none at all from S. A.

a. Wings not banded with fuscous. *H. amœnus*, Cress., Cuba. *H. bicinctus*, Cress., Cuba. *H. subflavescens*, Cress., Cuba. *H.* [*Cryptus*] *orbus*, Say, and six undescribed species from Illinois, U. S.*

b. Wings with one fuscous band. One undescribed species from Illinois, U. S.

c. Wings with two fuscous bands. *H.* [*Cryptus*] *tenellus*, Say, Penna., U. S. *H. thoracicus*, Cresson, Cuba. *H. nemativorus*, n. sp.

Through the kindness of the Editor, my cabinet has been enriched by a fine female specimen of H. *nemativorus*, of which I had previously possessed but three females, captured at large in Illinois. His account of its larval and pupal history is as follows : "On June 29th I observed to my surprise a Saw-fly cocoon (*Nematus ventricosus*, Klug.) attached to a leaf high up on a gooseberry bush, instead of on or under the surface of the ground as usual. Thinking that the unwonted situation might be the effect of a parasitic attack upon the larva, I brought the specimen in, and a few days afterwards found that there had emerged from it the Hymenopteron that I now send you!" Now, as I know that this very same species of *Hemiteles* occurs near Rock Island, in Illinois, where as yet *Nematus ventricosus* has not been introduced, it follows that it could not have been imported from Europe along with this pestilent Saw-fly, but must be in all probability an indigenous species. Hence we may draw the further conclusion, that a native American parasite can and sometimes does acquire the habit of preying upon a vegetable-feeding insect imported among us from Europe. The same conclusion, indeed, follows from a fact which I pub-

* In 1860 and 1861, as I have stated in a paper on the Injurious Insects of Illinois (Trans. Ill. St. Agr. Soc. IV., p. 349), I bred from 50 to 70 male and female individuals of an undescribed *Pezomachus* (*P. Heteropterus*, Walsh, MS.), a genus which is normally aptereous and has an aborted thorax like that of a worker ant. Out of this large number there were produced four males, which had the complete wings of a *Hemiteles*, and all the other characters of that genus, including of course the fully-developed thorax. Hence I infer that a *Pezomachus* is nothing but a degraded *Hemiteles*. I may add that this species—as well as two other *Pezomachus* in my collection, including *P. minimus*, Walsh—has no metathoracic thorns, and that the winged males belonged to B *a.* of this table.

lished in 1866 (*Pract. Entom.* I. p. 120), namely, that this very same Imported Saw-fly is preyed upon by another indigenous Ichneumon-fly, the *Brachypterus* [*Cryptus*] *micropterus* of Say, which was described in 1836, or twenty years before the Saw fly, which it now infests, had crossed the Atlantic. But on a question such as this, which is not only of great scientific interest, but of high practical importance, it is as well to make assurance doubly sure.

It may be remarked here that—as we shall have occasion to state also in a forthcoming illustrated Paper on "Currant and Gooseberry worms" in the *American Entomologist*—we have recently heard from Mr. Wm. Saunders, of London, Ontario, that *Nemetus ventricosus* very commonly with him spins up above ground on the bushes, as in the case referred to above. This fact is of especial interest, because it has not hitherto been observed in the States, and because European authors noticed it long ago as the habit of this same species on the other side of the Atlantic. Indeed Dahlbom was absurd enough to manufacture two species out of this one—although he says himself the perfect insects are as like each other as one egg is like another egg—basing his specific distinction solely upon this slight difference in the habits of his two so-called species. To be consistent he ought to have ground out a third species from those individuals that spin up, not under the earth, but on the surface of the earth. (See on this subject *Pract. Entom.* I. p. 125.)

HEMITELES NEMATIVORUS, n. sp.—Female rufous and almost microscopically punctate and subopaque. *Head* with the ocelli, and sometimes the space enclosed by them, black. Antennæ with joints 3 and 4 equal in length, and each four times as long as wide, joint 5 a trifle shorter than 4, joint 6 and the following gradually shorter and shorter; brown-black, their basal ½ or ⅔ rufous beneath with the incisures brown-black. *Thorax* with the parapsidal grooves obsolete, and the normal metathoracic carinæ strongly and fully developed. The suture at the base of the scutel, a narrow vitta on each side of the mesonotum abbreviated more or less in front or sometimes entirely absent, the extreme tip of the metathorax, and more or less of its basal part, or sometimes the entire metathorax except a lateral rufous spot at tip, all brown-black. *Abdomen* with joint 1 two and a half times as long as wide, and fully twice as wide at tip as at base; joints 2-8 forming a depressed oval mass 2¼ or 2½ times as long as wide and expanding in its middle to nearly twice the extreme width of joint 1. Joint 1, 2, and usually the base of 3, rufous, joint 1 sometimes clouded with brown-black, and in the Canada female entirely brown-black; the rest of the abdomen brown-black. Sheaths of the ovipositor brown-black, projecting from the tip of the abdomen by nearly half its length. *Legs* dull rufous. The 4 front legs with the femora superiorly and the tibiæ exteriorly, and the entire tarsi, all brown—black, the dark color most extensive in the Canada female. Hind legs with the tip, and in the Canada female the whole, of the femur, the entire tibiæ except their basal, 1-5 which is whitish, and also the entire tarsi, all-brown black. All the coxæ and trochanters sometimes, especially in Canada female, a little varied with brown-black, more so (as is usual in *Ichneumonidæ*) in each successive pair of legs. *Wings* hyaline; veins black; stigma twice as long as wide, triangular, black, its basal ¼ or ⅓ white. A fuscous band straddling the basal cross-veins of the front wing, and a much wider fuscous band

extending across the wing from the base of the stigma to the tip of the marginal cell, but always leaving a more or less extensive hyaline spot at the tip of the stigma. Length female (exclusive of ovipositor) 0.12–0.19 inch, the Canada female and one Illinois female attaining the largest dimensions. Two females from Illinois, one female from Canada ; male unknown.

Variety *fuscatus* —Female differs in being smaller, and in being still darker even than the Canada female, and may possibly, but I think not, be distinct. The black spot inclosing the ocelli extends on to the upper posterior orbits ; the entire upper surface of the thorax, including the scutel, is brown-black, except a narrow rufous vitta on each side of the mesothorax ; and as in the Canada female, the entire abdomen, except joint 2, is brown-black. Legs as in the Canada female. Wings normal. Length female 0.10 inch. One female from Illinois ; male unknown.

The ground-color of *tenellus*, Say, is said to be "honey-yellow," not rufous as in *nemativorus ;* he says nothing of the conspicuous basal white spot on the stigma ; and he described the abdomen as "honey-yellow, blackish at tip," whereas in my palest specimen by far the largest part of the abdomen is dark-colored. About the legs he says not a single word ; whence, as he gives "honey-yellow" as the general color, it is to be inferred that they were honey-yellow immaculate. Neither does he tell us whether he described from one specimen or from fifty ; so that we are left entirely in the dark as to how far the few characters which he givas may be considered as reliable specific characters, and how far as mere individual variations. On the whole we must consider the question whether *Cryptus tenellus*, Say, be identical with *Hemiteles nemativorus*, Walsh, as one of those unimportant scientific enigmas which—as Say's entire collection has perished—can never now be solved with any degree certainty, and about which it is therefere useless to bother our brains any further.

This species comes very near to *H. thoracicus*, Cresson, from Cuba, described from a single female, but may be distinguished as follows : 1st. The ground color is rufous, not "clay-yellow." 2nd. The dorsal lines of the thorax, or parapsidal groves, are entirely obsolete, not "deeply impressed." 3rd. The pleura is never "brown." 4th. The basal dark band of the front wing straddles the basal cross-veins, instead of being "at the base of the first sub-marginal cell." 5th. the abdomen always has joint 2 rufous and is never "brown with the apical margins of the segments somewhat pale."—I may remark here that in *Pimpla* [*Cryptus*] *conquisitor*, Say (equals *Cr. plurivinctus*, Say), and especially in *Pimpla annulipes*, Brulle ; the size of the largest female is double that of the smallest female, as I know from examining some 50 or 60 specimens of each species. So that the discrepancy in size between the largest *H. nemativorus* female (0.19 inch), and what I take to be a variety of this female (*fuscus* female, 0 10 inch, is by no means unparalleled in this Family.

NOTES AND EXPERIMENTS ON CURRANT WORMS.

BY W. SAUNDERS, LONDON, ONT.

The larva of *Nematus ventricosus*, alas, too well known under the popular designation of "currant worm," has been very abundant in this neighbourhood during the present season. In my own garden it has been a continual fight as to who should have the currant and gooseberry bushes, the worms or their rightful owner. During the early part of summer, anticipating their attack, I was on the look out for them and by timely doses of hellebore preserved the foliage with but little damage. In about a fortnight later, having omitted inspection for a few days, I was surprised to find the bushes being stripped again; and this time the enemy had got so far ahead as to damage their appearance considerably. Another prompt dosing of hellebore brought relief. After this I hardly ever found all the bushes entirely free from them; a walk around the garden would reveal a few here and a few there, and I was perpetually hand-killing and brushing off these smaller detachments. Four times during the season I found it necessary to apply hellebore freely, for the foes were a legion.

During the middle of August, being occupied with other matters, the garden was neglected for a few days, when on visiting it again on the 19th, I found many of the bushes entirely leafless, and the foliage remaining on the others was rapidly disappearing. I felt discouraged and began to have some misgiving as to whether hellebore was after all such an unfailing panacea for this almost universal pest, as we had supposed. I resolved if possible to satisfy myself fully on this point, and having mixed about 1½ oz. of powdered hellebore with a pail of water, was ready to proceed. I selected a leaf from two bushes, marked them and counted the number of their inhabitants—one was occupied by *forty four* worms of different sizes, crowding it above and below, and it was about half eaten; the other leaf had twelve nearly full grown on it. Having transferred the mixture of hellebore and water to a watering pot, the bushes were sprinkled with it. I returned to examine the result in three-quarters of an hour, and the leaf which at first had forty-four on it, had now only two, and these were so far exhausted that they were unable to eat and could scarcely crawl, while on the other leaf out of the twelve there remained three, but in the same enfeebled condition. All around under the bushes, the ground was strewed with the fallen foe, and I felt perfectly satisfied that entire reliance might be placed on this means of defence.

I did not anticipate such speedy action on the part of the hellebore or should have returned to the examination sooner, and the bushes were so entirely cleared, that excepting on one I had reserved for another experiment, I had no means of repeating the dose.

There was one thing that struck me as somewhat remarkable, the portion of leaf on which the greatest number were feeding appeared to be the same size as before the hellebore was applied ; if smaller I could not perceive it. When the leaves dry, which have been sprinkled with liquid, a very thin coating of the powder, more or less regular, is found over them, and I had always supposed that death resulted from eating a portion of the leaf thus coated. Such is undoubtedly the case when the hellebore is applied dry, but in this case a meal however small made by *forty-four caterpillers* on half a leaf, must have materially diminished it. I am disposed to believe then that the death of most of these must have resulted from their imbibing or absorbing some of the liquid as soon as applied. Many of them showed symptoms of the violent cathartic action of the remedy, having a mass of soft exuvia hanging to the extremity of their dead bodies.

I had reserved one bush, on which were a good number, for another experiment. It sometimes happens, especially with those who live in the country, that hellebore is not at hand when the worms are first observed at work, and a few days' delay in procuring it is perhaps unavoidable. In such cases the bushes may be entirely leafless before the remedy can be applied. Hot water suggested itself to my mind as likely to be of some service, and being also an article readily procurable in every home. It is well known that many plants will bear such an application without injury, provided the heat is not too great. Taking some in a watering pot a little hotter than one could bear the hand in, I showered it plentifully on the affected bush, and it was amusing to see how the caterpillars wriggled and twisted and quickly letting go their hold, fell to the ground, which was soon strewed with them. After the first excitement produced by the sudden heat was over, they remained as if wishing to "cool off" before commencing work again. A few did not recover from the application, but most of them were soon as active as ever.

Now what I would suggest is this, that where hellebore cannot be at once procured, no time should be lost in applying the hot water, and when once on the ground the creatures may have the life trodden out of them by the foot, or beaten out with the spade or some other implement. In any case many of them would never reach the bush again, for enemies beset them on every side. I was amused to see how busy a colony of ants were who had a home at the base of a tree near by, lugging these large caterpillars along, a single one of which would take three or four to manage. The worms were twisting and jumping about as if they wondered whose hands they had got into, and the ants were hanging on with their sharp jaws, and slowly dragging the bodies along. By and by they had quite a little pile accumulated, which would no doubt furnish them or their progeny with a feast of fat things for some time to come. Then there are the tiger beetles *(Cicindelidæ)*, with a host of others ever running about, looking for stray objects of this sort on which to make a dainty meal.

I had observed on one of the bushes, before applying the hellebore, some friends at word on these worms. They were immature specimens of a true bug belonging to the order *Hemiptera*, and probably the young of *Strietus fimbriatus*. These creatures are nearly round, about the size of a common lady-bird having the head, thorax and legs black, and the abdomen red with an elongated black spot in the centre, divided across by a whitish line. Approaching a caterpillar, they thrust their proboscis into it and quietly suck its juices until it becomes so weak and exhausted that it shrivels up and dies. With a view of testing the probable amount of good these friends were thus capable of accomplishing, I shut up two of them in a small box, with a dozen nearly full-grown caterpillars, and at the end of three days found that they had consumed them all ; also six in another box with one bug, and in this instance the rate of consumption was about the same, two caterpillars a day for each of these little creatures. The second time I fed them they did not get through their work quite so quickly ; possibly they may have overfed themselves at first.

While turning up the branches of some of my gooseberry bushes, I observed a number of whitish eggs on some of the leaves, arranged lengthwise in regular rows at short distance apart, on the principal veins or ribs of the leaf. Usually they were placed singly in the rows, but here and there double. These were the eggs of the currant worm, they were about one-twentieth of an inch long, four times as long as broad, rounded at each end, with a whitish glossy surface. On the branch I was examining there were three leaves with these eggs on ; two of them had their principal veins pretty well covered, while the third had but a few on it, as if this had been the work of a single insect who had exhausted her stock before the third leaf was covered. I counted these, and found there were 101 in all. Having just then caught one of the parent flies, a female who was hovering about as if looking for a place on which to deposit her eggs, I squeezed some eggs out of her body and comparing them with those on the leaf found they were only about half the size, showing that the first must have grown considerably after being laid and that they were probably nearly ready to hatch. In about three hours afterwards, I observed that several of the young larvæ had come out of the eggs, and placing the leaf under a microscope had the good fortune to see some of them escape. The egg consisted of a thin, elastic membrane sufficiently transparent to give a dim view of the enclosed larva. The black spot which is placed on each side of the head in this species enabled me to determine the position the creature occupied. It was somewhat coiled up and resting on its side with its jaws against the side of the egg not far from its extremity. I could not perceive that it had any other means of rupturing the egg than by its mandibles, which were working visibly within. In a short time the egg was ruptured and the head of the larva protruded from the orifice. Witndrawing its two front feet from the egg, it seized the leaf on which it was placed, and by raising up its back and working itself from side to side, it soon worked itself out. The time occupied in thus extracting itself

from the first appearance of the head, varied from six to ten minutes, for I watched several of them through the process. The egg was so thin and elastic that it yielded readily to the motions of the body, and adhered very closely to it, contracting and shrivelling up as the body was withdrawn.

After the larva comes out it does not consume the egg or any portion of it, as is the case with most lepidoptera, but sets to work at once eating the leaf on which its considerate mother placed it. When just hatched the worms are about one-twelfth of an inch long ; head large, dull whitish with a round dark spot on each side, and a few minute short hairs ; mandibles pale brown. Body above and below, whitish, semi-transparent, sometimes with a slight greenish tinge. From this time it rapidly increases in size, becoming green, then changing to green with many black dots, and finally reverting to plain green again, tinged with yellow at the extremities, just before it becomes a chrysalis.

I have a fact to communicate regarding the winter history of this insect. It has been universally held that the larvæ, when they leave the bushes in the fall, at once construct their cocoons, either at the surface of the ground or just below the surface, and change to a chrysalis either then or sometime before early spring. Possibly as a rule this may be the case, if so I have an interesting exception to record. On the 22nd of May I was trying some experiments in crossing gooseberries, fertilizing the flowers of the Houghton's Seedling with some of the large English varieties, and having operated on several branches, tied them up in new paper bags to prevent interference with the work, either from insects or otherwise. The particular bag I am about to refer to, was attached so an upright branch on the summit of the bush, about 18 inches from the ground. While examining it on May 31st, nine days afterwards, to ascertain the result of my work, I found in one of the folds of the bag a cocoon of *Nematus ventricosus* firmly attached to the surface of the paper. In this instance the larva must have remained unchanged during the winter, then crawled from the ground, attaching itself as related, and constructing its cocoon after the 22nd of May. A few days later, I found a similar cocoon attached to the bush, which from its fresh appearance I inferred had been constructed about the same time, although I am unable to advance any positive statement regarding it. During the summer I have found a considerable number of such cocoons fastened to the underside of the leaves of the bushes on which the larvæ have been, and these have been observed in all positions from near the base to the summit of the bushes, showing that it is not the invariable practice of the larva to undergo its change to chrysalis, either at the surface or under the surface of the ground.

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 7.)

CARABIDÆ

PTEROSTICHUS *(cont'd)*:
Rejectus, *Lec.*
Adoxus, *Say.*
Rostratus, *Newm.*
Chalcites, *Say.*
Lucublandus, *Say.*
Erythropus, *Dej.*
Caudicalis, *Say.*
Corvinus, *Dej.*
Patruelis, *Dej.*
*Femoralis, *Kirby.*
Mutus, *Say.*
Adstrictus, *Germ.*
Luczottii, *Dej.*
Coracinus, *Newm.*
Adjunctus, *Lec.*
Stygicus, *Say.*
Protensus, *Lec.*
Honestus, *Say.*

AMARA, *Bon.*
Avida, *Say.*
Angustata, *Say.*
Impuncticollis, *Say.*
Fallax, *Lec.*
*Erratica, *Zim.*
Interstitialis, *Zim.*
Obesa, *Say.*
Subaenea, *Lec.*

LOPHOGLOSSUS, *Lec.*
Scrutator, *Lec.*

BADISTER, *Clariv.*
Pulchellus, *Lec.*

DICÆLUS, *Bon.*
*Simplex, *Dej.*
Elongatus, *Dej.*
Teter, *Bon.*
Politus, *Dej.*

DIPLOCHILA, *Brul.*
Laticollis, *Lec.*
Major, *Lec.*
Impressicollis, *Dej.*

ANOMOGLOSSUS, *Ch.*
Emarginatus, *Say.*

CHLÆNIUS, *Bon.*
Lithophilus, *Say.*
Sericeus, *Forst.*
*Solitarius, *Say.*
Chlorophanus, *Dej.*
Pensylvanicus, *Say.*
Tricolor, *Dej.*
Impunctifrons, *Say.*
Niger, *Rand.*
Tomentosus, *Say.*

ATRANUS, *Lec.*
*Pubescens, *Dej.*

OODES, *Bon.*
Fluvialis, *Lec.*

HAPLOCHILE, *Lec.*
Pygmæa, *Dej.*

GEOPINUS, *Lec.*
*Incrassatus, *Dej.*

AGONDERUS, *Dej.*
Lineola, *Fab.*
Pallipes, *Fab.*

ANISODACTYLUS, *Dej.*
Rusticus, *Dej.*
Carbonarius, *Say.*
*Punctulatus, *Lec.*
Harrisii, *Lec.*
Melanopus, *Hald.*
Nigrita, *Dej.*
Discoideus, *Dej.*
Baltimorensis, *Say.*
*Sericeus, *Harris.*

AMPHASIA, *Newm.*
Interstitialis, *Say.*

EURYTRICHUS, *Lec.*
*Piceus, *Lec.*
Terminatus, *Say.*
*Agilis, *Dej.*

BRADYCELLUS, *Er.*
*Vulpeculus, *Say.*
*Autumnalis, *Say.*
*Arenarius, *Lec.*
*Badiipennis, *Hald.*
Lugubris, *Lec.*
Rupestris, *Say.*

HARPALUS, *Latr.*
Caliginosus, *Fab.*

---

1 Lake Shore, under pieces of wood.

HARPALUS *(continued)*.
Erraticus, *Say.*
Amputatus, *Say.*
Faunus, *Say.*
Pensylvanicus, *Degeer.*
Erythropus, *Dej.*
Pleuriticus, *Kirb.*
Herbivagus, *Say.*
Varicornis, *Lec.*
*Vagans, *Lec.*
STENOLOPHUS, *Dej.*
Fuliginosus, *Dej.*
Conjunctus, *Say.*
Ochropezus, *Say.*
*Dissimilis, *Dej.*
Partiarius, *Say.*

PATROBUS, *Dej.*
Longicornis, *Say.*
BEMBIDIUM, *Latr.*
Inæquale, *Say.*
Nitidum, *Kirb.*
Dilatatum, *Lec.* 2
Chalceum, *Dej.* 2
*Fugax, *Lec.*
Planum, *Hald.*
Lucidum, *Lec.*
Picipes, *Kirb.*
Gelidum, *Lec.*
*Nitens, *Lec.*
Dorsale, *Say.*
Patruele, *Dej.*

BEMBIDIUM *(continued)*.
Variegatum.
Versicolor, *Lec.*
*Frontale, *Lec.*
Quadrimaculatum, *Linn*
*Garinula, *Chaud.*
*Wingatii, *Bland.*
TACHYS, *Zie.*
*Scitulus, *Lec.*
*Lævus, *Say*
Nanus, *Schaum.*
Flavicauda, *Say.*
Incurvus, *Say.*
*Pulchellus, *Ferte.*

DYTISCIDÆ.

HALIPUS, *Latr.*
Triopsis, *Say.*
Immaculicollis, *Harris.*
CNEMIDOTUS, *Ill.*
12-Punctatus. *Aube.*
HYDROPORUS, *Clair.*
Punctatus, *Aube.*
Affinis, *Say.*
*Granarius, *Aube.*
*Consimilis. *Lec.*
*Lineolatus, *Lec.*
Catascopium, *Say.*
Modestus, *Aube.*
*Varians, *Lec.* 1
Tenebrosus, *Lec.*
*Oblitus, *Aube.*
*Collaris, *Lec.*
*Concinnus, *Lec.*
*Patruellis, *Lec.*
*Nubilus, *Lec.*

LACCOPHILUS, *Leach.*
Maculosus, *Say.*
COPTOTOMUS, *Say.*
Interrogatus, *Aube.*
MATUS, *Aube.*
*Biacrinatus, *Aube.*
COPELATUS, *Er.*
*Glyphicus, *Lec.*
AGABUS, *Leach.*
*Parallelus, *Lec.*
Punctulatus, *Aube.*
*Tæniolatus, *Lec.*
*Semipunctatus, *Lec.*
*Stagninus, *Lec.*
*Obtusatus, *Lec.*
**Scapularis, *Mann.*
Fimbriatus, *Lec.*
Ambiguus, *Lec.*
COLYMBETES, *Clairv.*
Biguttulus, *Lec.*

COLYMBETES, *Clairv.* *(continued)*.
Quadrimaculatus, *(Aube.)*
Picipes, *Kirby.*
*Sinuatus, *Lec*
Sculptilis, *Harris.*
Binotatus, *Harris.*
HYDATICUS, *Leach.*
*Basillaris, *Lec.*
ACILIUS, *Leach.*
Fraternus, *Lec.*
DYTISCUS, *Linn.*
Confluens, *Say.*
*Anxius, *Mann.*
Cordieri, *Aube.*
Fasciventris, *Say.*
Harrisii, *Kirby.*
*Verticalis, *Say.*
Hybridus, *Aube.*

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* Species marked with an asterisk have not been before included in the list of Canadian Coleoptera.

1 Taken last year in Bosanquet, but mentioned here as it has not been before included in the list of Canadian species.

2 Taken at Goderich.

MISCELLANEOUS NOTES.

PARSNIP LARVA.—Mr. James Angus, of West Farms, N. Y., writes as follows respecting our notice of this insect in the last number of the *Canadian Entomologist*. "I am pleased with your description of the Parsnip Depressaria; it is an old acquaintance of mine. I have raised the larvæ and noticed their habits for many years. It seems to be very closely allied to, if not identical with a British species, *D. heracliana*, an abdomenless specimen of which I have in my collection." On again comparing our specimens with the brief descriptions in Stainton's *Manual*, we notice a great resemblance to that of *D. heracliana*, which had not struck us before. It is not at all unlikely that our species is an imported insect, like a great many more of the farmers' and gardeners' worst pests. We shall take an early opportunity of sending some of our specimens to England in order to have the question settled, and should the insect prove to be a British species we shall gladly withdraw the name that we have given it. We have no desire to multiply names or synonyms, which are becoming such a nuisance to Entomologists, but being unable to identify our insects from any description that we had access to, we determined—with some hesitation—to give it a name which could easily be withdrawn if the species proved not to be a new one.

LARVA OF HYPERCHIRIA VARIA, Walk.—On the 25th of July last, I found closely huddled together on the under side of a locust leaf (*Robinia pseudacacia, L.*) a cluster of fifteen small bristly caterpillars of a dark brown color. On opening the chip box in which they were confined, some hours after their capture, I found them ranged in a single line obliquely up and down its sides; when disturbed they set off in a procession round and round the box, following their leader in a most grotesque manner. After this whenever I looked at them, till they became very large, they were always either ranged in a single column, or very closely huddled together. By and by they became so large that the line of fifteen exactly measured the inner circumference of the box, and then, by dint of a little persuasion, I got them to form an endless procession around the inside of the box, each one following closely the individual before him. They went on in this way for upwards of half an hour, and looked as if they would have gone on for ever, till I thought they had had exercise enough, and broke up the column. At this time their length was 0.35 inch; their general color black; body entirely covered with long sharp compound black spines, so thickly branched on every side as to form a complete *chevaux de frise*—the terminal spinelets ended in a fine hair, the main stem being jet black, the side branches white tipped with black; along the sides there was a reddish-white line, and another of the same color through the spiracles. In other specimens the two lateral lines and the space between them formed together a band of reddish-white.

Up to the 16th of August I did not recognise the species of these caterpillars, though I fancied they belonged to the *Saturniadæ*, but on my return on the 28th, from the meeting of the American Association at Salem, I found rather to my surprise, that they had grown to be about two and a half inches long, and were of a delicate yellowish-green colour with an abbreviated reddish lateral band. They had proved to be the very familiar larvæ of what is commonly known as the Io Emperor-moth of Harris (*Hyperchiria varia*, Walk.) One of them began to form his cocoon on the 7th of September, the rest are still feeding, and a prodigious quantity they eat. I have reared these larvæ before, though never from their infancy, and found them to feed on the leaves of Willow and Elm. Dr. Harris (Ins. Mass., p. 393), states that they "live on the balsam poplar and the elm, and, according to Mr. Abbot, on the dogwood or cornel and the sassafras; they feed well also on the leaves of clover and Indian corn." In his 'Entomological Correspondence,' p. 295, he states that a brood of these larva fed on *Robinia viscosa*. Dr. Fitch (4th Report, p. 81), gives the cherry as the food plant, and also (5th Report, p. 52), the locust. Mrs H. C. Freeman (Amer. Ent. i. 39), states that she found it feeding on the hop vine. It thus appears that they are by no means particular as to their diet. The imago usually appears between the 1st and 20th of June; those I bred last pear and kept in the house came out in April.—C. J. S. B.

Notes on a few Beetles.—Perhaps it may interest some of the readers of the Entomologist to mention that that rare beetle, *Necrophilus subterraneus*, Fab., may be found during the last of September and in the early part of October in decomposing fungus, particularly the "toadstool" species growing in clusters on decaying logs. My earliest specimen was taken on the 27th of September, the latest on October 13th. It is probably well known to all who have taken *Haplochile pygmœa*, Dej., that it emits when handled a most unpleasant and powerful odor, exceeding that of *Chrysopa*, and requiring repeated applications of soap and water to remove it from the fingers.—*Trichodesma* (*Anobium*) *gibbosum*, *Say*; of this species I dug three specimens out of a dead maple tree in Oxford, January, 1867, and early in July of the present year I obtained a number by beating the limbs of trees.—J. Pettit, Grimsby, Ontario.

Scudder's "Butterflies of New England."—I am very desirous of seeing collections of Insects from every part of New England, New York, New Jersey and the Dominion of Canada, and repeat the promise made in the spring, of naming any collection of butterflies from these districts sent by express to the address below, early in October. I beg those who can do so to send not one specimen only of a species, but as many as possible, especially among the Hesperidæ and the genera Lycæna, Thecla, Limenitis, Argynnis, Militæa and Grapta, whose some species have for a long time been confounded. The insects

should be numbered—at least with one number for a species—and where any specimen is sent, not obtained from the immediate vicinity of the sender, it should invariably be labelled with the locality where it was taken. If the collection is accompanied by the dates of capture of the different specimens, or a general table of the exact times of appearance and disappearance of the butterflies in the region where they were captured, the collection would have a double value Specimens of the parasites of butterflies are also desired when it is known what species they attack—or the chrysalids from which the parasites have been bred can be sent; these also will be named and can probably be returned with the others.

Specimens in all cases should be pinned *strongly* in small light boxes, lined on the bottom with cork, pith, or soft wood; these boxes should then be wrapped in paper and packed in a larger box with an abundance of dry stuffing, such as crumpled paper, shavings, or coarse straw—not too tightly crowded, but so arranged as to leave from one and a half to two inches of stuffing around the *whole* interior of the outer box. If these directions are regarded little danger need be feared.

Collections sent to me by the first or middle of October next will be returned by the first or middle of the following January; for the safety, however, of my own collection, and of others entrusted to me, it will be necessary to return at once and unnamed, any collection showing traces of having been attacked by Museum pests.—SAMUEL H. SCUDDER, Boston Society of Natural History, Berkeley Street, Boston, Mass.

BOOKS RECEIVED.

Record of American Entomology for the Year 1868. Edited by A. S. Packard, jr., M.D., Salem. Naturalist's Book Agency. (8vo. pp. 60. Price, $1.)

Every American Entomologist must have felt from time to time the want of some ready means of "keeping track" of what his fellows have published in the various scientific periodicals of the day. He need now be troubled no more, as the "Record" before us is intended to supply the want year by year, and to afford a convenient index to all that is written about American insects. This first volume of, we trust, a long series, contains references to four hundred and two new species of insects from North America, and four new false scorpions, and to articles and notices by forty-five different writers. This is certainly a gratifying record, especially when it is observed that, with two exceptions, no notices are included of papers published in European journals, copies of them not having been obtained in time. In future it is intended to refer to all American papers of the current year, and to European publications of the preceding year, in order to make the "Record" as complete and useful as possible. The

Editor, Dr. Packard, has been assisted in his work by some of the leading Entomologists of the day; while he records the notices of the Hymenoptera, Lepidoptera (Heterocera) and Arachnida, Mr. Schuder takes the Lepidoptera (Rhopalocera) and Orthoptera; Baron Osten Sacken the Diptera; Dr. LeConte the Coleoptera; Mr. Uhler the Hemiptera and Neuroptera, and Dr. Hagen the Pseudo-Scorpions.

A Guide to the Study of Insects. By A. S. Packard, jun., M. D. Parts viii., June, and ix., August, 1869. Salem: Naturalists' Book Agency. (50 cents per Part.)

These two parts contain the conclusion of the Coleoptera, the whole of the Hemiptera, and the beginning of the Orthoptera. They are, as usual, copiously illustrated, containing between them nearly two hundred excellent wood cuts. It is announced that one more part will complete the work.

First Annual Report of the Trustees of the Peabody Academy of Science. Solem, Mass., 1869. 8vo. pp. 103.

Through the munificence of Mr. Peabody, of wide-world celebrity, who gave the sum of $140,000 for the "promotion of science and useful knowledge in his native County of Essex," the Peabody Academy of Science has been founded at Salem by the amalgamation of the Essex Institute and the old East India Marine Society. The new Academy was inaugurated in a befitting manner during the recent meeting of the American Association at Salem, and has now entered upon, we trust, a long career of usefulness and prosperity. The report before us sets forth all the particulars respecting the foundation of the Academy and the formation of its admirable museum, and includes interesting and valuable reports by the Director (F. W. Putnam) and the Curators, who are widely known as the joint Editors of the *American Naturalist*. Dr. Packard adds a list, with descriptions of new species, of the Hymenopterous and Lepidopterous insects collected by the Smithsonian Expidition to South America under Prof. Orton; and Mr. Morse, a description of a new shell (*Actinobolus*) taken in Essex County. The "proposed plan of operations" submitted by the Director and Curators is well worthy the consideration of all connected with similar institutions, and might be advantageously followed by our own "Canadian Institute" at Toronto. Would that some of our men of wealth could be induced to take an interest in this institution, and place it in a permanent and efficient condition, so as to enable it to accomplish for this Province what the Peabody Academy is now doing for its own County of Essex.

The Canadian Naturalist. New Series, Vol. iv., No. 2, June 1869. Montreal: Dawson Brothers. ($3 per vol.)

We are glad to hear that this long-established Journal has now been placed upon a new footing, and is likely to be issued with regularity. Instead of appearing bi-monthly as before, it is now to be issued quarterly, though with the same amount of matter as formerly in the volume; it is to be conducted by an editing committee of members of the Natural History Society of Montreal, and is to

include a larger field of popular science than before. The number before us contains many interesting articles in various departments of science, including one in our branch of Natural History, viz, "The Toad as an Entomologist," by A. S. Ritchie. The writer advocates the slaughter of toads in the early morning for the purpose of obtaining the specimens of insects they had swallowed during the night! This appears to us a horrible mode of collecting, and judging from the few rarities obtained a most needless cruel operation. The results derived from the murder of the poor toad do not tend so much to the advancement of science as to justify the shedding of their innocent blood. We hardly fancy the example will be widely followed—the very thought of ripping up some wretched toads before breakfast in the morning to get at the beetles inside, makes one's blood run cold!

The American Entomologist. An illustrated Magazine devoted to practical and popular Entomology. St. Louis, Mo., Vol. i., No. 12, August, 1869.

This excellent publication has now come to the end of the first volume, and is to appear henceforth in a new and improved style, with an ornamental wrapper, on better paper, with an increased number of pages, and at a doubled price. The August number, which contains a splendid coloured plate of *Cerotocampa regalis*, affords a sample of the new dress and other improvements.

The American Naturalist. Salem, Mass. Vol. iii., No. 7, September, 1869. As interesting and attractive as ever.

Le Naturaliste Canadien. Quebec, August, 1869. Contains a description and figure of a new Hemipteron, *Nabis Canadensis*, Provancher.

The American Agriculturist. New York, September, 1869.

Newman's Entomologist. London, Eng., Nos. 67 and 68. From Mr. Reeks. The former number cootains an interesting account of an undescribed light-giving Coleopterous larva from Brazil.

Hardwicke's Science-Gossip. London, Eng., August 1, 1869.

The Canada Farmer. Toronto, August 15, 1869.

The New York Sun. New York.

The Maine Farmer. Augusta, Me.

The Orthoptera of the State of Maine, and Notes on American Cancaroid Crustacea. By Sidney I. Smith.

Contributions to Zoology from the Museum of Yale College. No. 1, by A. E. Verrill, and No. 2, by S. I. Smith.

Entomological Notes. Part II. By S. H. Scudder. 48 pages, 8vo. Boston, 1869. These notes contain a number of valuable papers on Orthoptera, and an account of some diurnal Lepidoptera from Alaska.

TO CORRESPONDENTS.

SUBSCRIPTIONS RECEIVED.—To Vol. II.: From J. A., Brooklyn; J. A., West Farms; G. W. P., New York (with *Am. Ent.*); A. J. C., Lansing (Ditto); E. B., Boston; W. W. B., Indianapolis; Rev. Dr. D., Baltimore (Vols. I. and II. and *Am. Ent.*); J. G. M., Baltimore (Vols. I. and II.); C. E. H., Waterville, Me.

REV. F. O. MORRIS.—Dr. Butterfield, who has returned from California to his former address, writes that several months ago he received a letter from you stating that a box of insects had been sent to him, but he has never heard anything further respecting them. He will make enquiries in the proper quarter.

F. W., Wanstead, Eng.—C. B. M., Lep. Heteroc., Part xx., *Geometrites*, received; also, per Smiths. Inst., a copy of your "Catalogue of the Homopterous Insects collected in the Indian Archipelago, etc.," and two boxes of specimens. For all of which please accept our best thanks.

SUBSCRIBERS are respectfully reminded that their subscriptions to Vol. II. of the CANADIAN ENTOMOLOGIST are now due.

LEPIDOPTERA.—I have obtained from pupæ of last season a good supply of *Cerotocampa regalis*, *Eacles imperialis*, and that rarity *Sphinx jasminearum*. There are several species of Sphinx and Catocala that I am anxious to obtain, especially a good male *C. relicta*.—JAMES ANGUS, West Farms, N. Y.

ARCTIA PARTHENOS is very much enquired after; any collector who has obtained duplicates of this rare species will do well to communicate the fact.

LEPIDOPTERA FOR SALE.—A friend has a very fine collection of N. American Lepidoptera, including rare Sphingidæ, which he wishes to dispose of. They are in perfect condition, and many of them rare. For particulars apply to GEO. W. PECK, 129 Maiden Lane, New York. *(Advt.)*

ENTOMOLOGICAL PINS.—The long expected supply of pins has at length arrived; they were delayed, it appears, by the illness of M. Klaeger, the manufacturer. By some, at present, unaccountable mistake, only half the order has been filled, and we have received to our great disappointment merely the coarser sizes. We have thus plenty of Nos. 4, 5 and 6, but none of 1, 2 or 3. The price is $1 per thousand ($1.25 in U. S. currency). No. 4, in packets of 500, at 50c. each; Nos. 5 and 6, in packets of 250, at 25c. each. Parties ordering will please state whether they wish them sent by mail or express.

CLUB RATES.—We beg to direct the attention of our readers, who are now renewing their subscriptions, to the following advantageous club rates that we are enabled to offer them:

THE AMERICAN NATURALIST ($4) and the CANADIAN ENTOMOLOGIST ($1) for three dollars and a half per volume ($4.50 in U. S. currency).

THE AMERICAN ENTOMOLOGIST ($2) and the CANADIAN ENTOMOLOGIST ($1) for two dollars per volume ($2.50 in U. S. currency).

Those who desire to take advantage of these terms will please inform us as soon as possible, that we may be enabled to complete our lists.

The Canadian Entomologist.

VOL. II. TORONTO, NOVEMBER 1, 1869. No. 3.

THE GRAPE-SEED INSECT.

(*Isosoma vitis*, n. sp.)

BY W. SAUNDERS

In Vol. i., No. 3, page 20, of the *Canadian Entomologist*, I published a description of a larva found infesting the seed of the grape, and in the *Canada Farmer* for October 15, 1868, page 316, a fuller description of its habits and destructive powers, and ventured the opinion that it would probably produce, when mature, a small curculio. In this I was in error, for the perfect insect proves to be Hymenopterous, a small four-winged fly belonging to *Isosoma*, and as it is believed to be undescribed, I propose for it the name of *vitis* (*Isosoma vitis*, n. sp.). The following notes on its history were made subsequent to the date of the issue referred to.

In October I detached a larva from the inside of the seed, and placed it in a small glass cell between two plates of glass, in which state it remained until early in January, when it became a chrysalis, having first attached itself to the sides of the cell by a few short silky threads. It had now contracted in length, become nearly oval, and assumed a yellowish tint, with a few short loose silky threads adhering to different parts of its surface. On the 11th of February I examined some seeds and found the larva within still alive and active, just as it appeared in the fall. On the 7th of July further specimens were opened and the inmates found soft and motionless, these appeared to be in the chrysalis state, but I did not examine them with sufficient care to enable me to be positive. During the remaining part of July I looked many times into the bottles in which the grapes were enclosed but could not discover anything. On the 9th of August, feeling sure that the time for the appearance of the insect must be fully come, if not already past, I resolved on a thorough search for it. As soon as the contents of the bottles had been emptied on a piece of white paper, I observed a number of small four-winged flies among the dried-up grapes. They were all dead and stiff, some of them more brittle than others. From the observations made I should judge that they made their

escape from the middle to the end of July. The following is a description of the female described from seven specimens.

ISOSOMA VITIS, female, n. sp.—Expands about one-sixth of an inch. Head large, flattened in front, black, thickly punctured, and covered with many short whitish hairs; mandibles pale brown at base, tipped with black; antennæ black, thickly covered with whitish hairs, nine joined, inserted in deep sockets; the first joint pale brown, more slender than the others, very long, nearly as long as the three following, the second short, third to eighth inclusive nearly equal in length, the terminal joint longer, tapering slightly towards the tip. Throax black, punctured, and covered with whitish hairs.

Wings clear, iridescent, venation simple, consisting of a single vein. On primaries the basal portion of this vein runs a little above the middle of wing, when less than half way towards the apex it is curved to the costal margin where it is thickened, and runs parallel with the edge a short distance; then dividing, one portion extends somewhat further along the edge of the wing lessening in thickness towards the extremity, the other with a short outward curve terminates a little within the costal margin, and is widened at the tip. There is a slight duskiness about the inner portion of these branches, extending back to near the point where the vein first joins the costal edge.

The basal portion of vein on secondaries is thickest, and is coalescent with the costal margin for nearly one-third of its length, then contracting in size it turns inwards another third towards the middle of wing,—the terminal third increasing in size, extends to the costal margin, and runs a short distance parallel with it, the whole vein extending little more than half the length of wing. Both veins are sprinkled with many minute black dots, from which arise short black hairs; they are also partially fringed with hairs.

Abdomen long, black, straight smooth with a polished surface, placed on a short pedicel—the first ring very narrow, second and third a little wider and nearly equal in size, the fourth fully as wide as the three preceeding, fifth less than half the width of fourth, sixth a little shorter, terminal ring somewhat longer. The abdomen is a little contracted at its anterior extremity thickest on the third ring, lessening gradually in size till it reaches the last two segments, which are suddenly contracted, the terminal one ending in a point, with a few whitish hairs about and near the top. Anterior pair of feet pale brown, trochanters nearly black, second and third pairs have the trochanters black, femur and tibia nearly black along the middle, pale brown at each extremity, tarsi pale brown.

The male differs from the female in having the joints of the antennæ somewhat longer and more thickly covered with hairs; the hairs are also longer;

the abdomen is short, thick, and blunt, placed on a moderately stout pedicel nearly its own length. The abdominal rings have about the same relative size as in the female, but the posterior edge of third overhangs the fourth, the latter appearing as if partially drawn within the projecting edge of third ring.

I am indebted to my esteemed friend, Chas. V. Riley, State Entomologist of Missouri, for the correct placing of this insect, and would refer those who desire further information on this and other closely allied genera, to a valuable paper by the Senior Editor of the *American Entomologist*, in that interesting periodical, Vol. I., No. 8, illustrated by excellent figures, from accurate drawings made by the Junior Editor.

Having kept the grapes in bottles, only occasionally opened for ventilation, in a dry room, they had become quite hard, dry and shrivelled. In consequence of this many of the flies were unable to make their way out, the seed having become too hard for their jaws to eat through. On opening some of these the flies were found dead with wings fully developed and surrounded by small fragments of the interier coating of the seed which they had evidently gnawed off while endeavoring to escape. Those which had found their way out had eaten a small nearly round irregular hole through seed and skin. In many similar cases where the larva feeds within a hard substance it provides for the escape of the perfect insect by eating away the hard enclosure until it is reduced so thin as to appear almost transparent, then a very little effort is sufficient to remove the obstruction to the outward passage of the imago. In this instance I have been unable to detect any such preparation, and believe that the whole work of escape is accomplished by the perfect fly.

Notwithstanding the abundance of this insect last year, I have as yet been unable to detect their presence or any evidence of their work during the present season, probably the cold and wet character of the summer has been unfavorable to their operations.

BRIEF NOTES ON THE TRANSFORMATIONS OF SEVERAL SPECIES OF LEPIDOPTERA.

BY CHAS. S. MINOT, BOSTON, MASS.

1. *Actias Luna.*—Eggs laid at night by a female in confinement, on April 30th, (this is an exceptional case, they are not generally laid until June.) They are lateriform, obrotundate, smooth, approaching in some cases a spheroid, opaque, very dark sepia with a faint tinge of olivaceous, though some specimens were marked with broad white bands irregularly disposed, and a very few almost entirely white.

2. *Ceratomia Amyntor* Hubn, (*Quadricornis* Harr.)—Eggs sub-spheroid hyaline, very light yellowish green, without corrugations or striæ, highly luteous. Laid on the 9th June—hatched on the 19th. Larva just hatched, .18 inch, elongated, attenuate, swelling at each extremity, the thoracic diameter being the greatest; colour yellowish-green; and horn .09 inch acuminate and black. After the first moult it assumes the appearance of the full-grown larvæ in everything excepting size. It moulted six times; full-grown specimens being seen in September.

3. *Mamestra Arctica* Boisd.—Eggs laid June 13th. Form above circular, tapering towards the apex, flattened at the base; transverse diameter less than longitudinal; luteous, pale yellowish-green; a cordate impression upon the slightly flattened apex; a little smaller than the eggs of *Chrysophanus Epixanthe*. They hatched while I was not at home, and therefore I am unable to give any further account of the metamorphoses of the insect.

4. *Tetracis lorata* Grote.—From two females confined in a box, I obtained on June 18th-20th over three hundred eggs. These are subovate, slightly flattened at the larger end, varnished. From 15 to 40 eggs are laid at a time, during the night only; they are deposited about 100 in one spot, in curving, sometimes angulated rows, which have the appearance somewhat of radiating from a common centre. When first laid they were yellowish-green; on the 20th they had become ochra-olivaceous; on the 21st indian red, and by the 28th or 29th the greater part appeared gray, which effect was caused by innumerable minute black atoms on a whitish ground. On the 31st they were all a deep, though rather dull purple. Hatched on the 30th and 31st. Some of the larvæ lived until July 7th. Head several times larger than the prothorax, ochraceous, luteous, sub-globose; anal segment much enlarged, white; prop-legs, two pairs, white. The enormous head and anal segments gave these caterpillars the appearance of minute, animated dumb bells. Above, fuliginous; stigmatical line, white; beneath, pale red. They were very active, almost constantly in motion. Each time before looping, it rears itself up on its hind legs, and turns round in every direction, as if scrutinizing with almost every food plant I could think of.

The changes the eggs went throw are most remarkable and interesting. I have been unable to learn of anything at all equal to it. If any of the readers of this journal know of any parallel case, or have any explanation to offer as to these extraordinary alterations of the colour, I should be very glad to hear from them.

5. ——— ——— ———Mr. Scudder has in his collection the larval stage of an insect closely allied to this, both he and Dr. Packard

are at a loss to assign it to its systematic position; they also agree in considering it not to be *Rhopalocerous*. The eggs were laid on a currant leaf, and were received by me through Mr. Scudder after a three days journey. The following description was made soon after I received them, July 18th. Long. diam. .07, trans. diam. .05 inch. Top-shaped, tapering towards the apex, where they were slightly flattened; sides much compressed, lacteous, sordid, with a large jet spot on each of the compressed sides, and a blace dot above. Just before hatching, the spots disappear, the ground colour becomes pale lemon yellow, and the shell is luteous. Larvæ appeared on the 29th.; the first act of their existence was to eat the egg shells entirely, except the basal part by which they were glued to the leaf. When two days old, these caterpillars are one-sixteenth of an inch long; head large, perpendicular, top-shaped, reddish-brown, luteous; eyes black, shining; mouth small, jaws not powerful; body tapering towards urite, above yellowish-brown, lighter underneath, very distinctly separated along the stigmatical line from the darker shade of the upper surface. Above, on each segment four black spines, branching thus—first a stout pedicel, branched like a Y, the inner branch being shorter than the outer, both divarications ending in four setoid appendages, three very short, and the fourth and exterior one as long as the rest of the spine and curving like that portion of the ellipse which would be included between two adjacent points of the intersections of the transverse and longitudinal axes with its circumference. These spines are .05 inch long. Whenever they move they march in single file. From several experiments I made, I am satisfied that they have no certain leader in moving. Their eyes seem to be useless, for they did not appear to perceive any difference between light and darkness, the leader seeming to feel his way along in a manner very ususual for larvæ, and those behind having each a very delicate silken thread about the length of the head of the larvæ, which attaches it to the one in front. There are prop-legs on the 2nd., 3rd., 4th., 5th and last abdominal segments.

ENTOMOLOGY AT HELLMUTH COLLEGE.

At the request of the Head Master, the Rev. A. Sweatman, I recently accompanied my friend, Mr. W. Saunders, to the college, to adjudicate the prizes given for the collections of native insects, made by the boys during the summer vacation. Considering that this is the first effort of the school at entomology the result is most gratifying, and I feel sure that some slight notice of these collections will be of interest to the readers of the *Entomologist*.

The first prize, value $15, was awarded to William Hugh Wood, who resides in Walsingham, in the county of Norfolk, and contained representa-

tives of Lepidoptera, Coleoptera, Orthoptera, Hemiptera, Diptera, Neuroptera, and Hymenoptera, embracing about 140 different species, amongst which we noticed in Lep., Heteropterus marginatus, Catocala epione, Darapsa chœrilus, Homoptera lunata, and a very handsome Catocala quite new to us, with a distinct white spot in each forewing; in Col., Dytiscus verticalis, Carabus sylvosus, Toxotus decoloratus, Telephorus rotundicollis, Necrophorus Pustulata, and Tomoxia————————; also two new species of Neuroptera. This collection is very good, and reflects great credit on the industry and perserverance of Master Wood.

The second prize, value $5, was gained by Wm. G. Hodgins, of Toronto. This was a fair collection containing some 90 species, but bore traces of having been somewhat augmented from the collection of a tolerably experienced entomolgist.

Other collections were exhibited by Messrs. R. D. Bourke, and R. Dewar, of London, and J. R. C. Dobbs, of Portsmouth, and although these last named boys obtained no prizes, they are entitled to some praise for their efforts. These collections are given to the school to form the nucleus of the school collection, and in a very short time I expect to see the cabinet well stocked.

I may add that the Head Master takes a great personal interest in our Society, and is giving the boys every encouragement to develope their tastes in this and all other branches of natural history.—E. B. Reed, London, Ont.

DESCRIPTION OF LARVA OF CATOCALA POLYGAMA, Guen.

BY E. B. REED, LONDON, ONT.

Taken at Port Stanley, Ont., July 1, 1869, *feeding on Thorn.*

Length, 1 and four-tenth inches; body cylindrical inclined to onisciform.

Head, flat, bilobed and horned or notched, dark brownish red with several long hairs just above the mandibles and collar.

Body, plump, smooth and firm to the touch; color, greenish grey with small spots and blotches: on the seventh segment, two lateral black spots; on the eight segment, a small fleshy dark coloured horn curved backwards; the anal segment terminated by two elongated prolegs; on each segment are two dorsal spots or pimples with one long hair in each; a thick fringe of greyish hair on the base of the sides; the spiracles blackish not distinctly marked.

Under side, greenish white, with a central row of blackish spots, largest in the centre of the body, and growing smaller towards each end.

Feet, grey; prolegs greenish gray.

This description was made July 7, and the larva commenced going into chrysalis the same evening.

A slight cocoon was formed by drawing together two leaves of thorn, to one end of which the larva attached itself by a few threads of silk. Length of pupa sixth-tenths of an inch: greatest breadth ⅛ of an inch; the colour at first light reddish brown, becoming dark on the 4th or 5th day, the whole covered with a plum-like bloom; the tongue and wing cases very clearly defined; head case blunt; the imago was produced July 29, after about 21 days; its alar expansion was 1 and seven-tenths inch.

As far as I can ascertain, this is the first time this larva has been described I have taken it before, but failed to describe or rear it.

THE IMPORTED CURRANT WORM FLY (*Nematus ventricosus*, Klug.) AND ITS PARASITE (*Hemiteles nematívorus*, Walsh).

BY BENJ. D. WALSH, M.A.

I wish to correct a few mistakes which I have made in the paper on this subject, which was published in the ENTOMOLOGIST, Vol. II., No. 2.

1st. I have said that "not a single American species of *Hemiteles*, so far as I am aware, has as yet been described under that generic name as occurring north of the West India Islands." This is incorrect. Mr. Riley, in his Missouri Report, has described two species, viz., *H. thyridopteryx* male and female, and *H. Cressonii* male, as found in his State.

2nd. In *H. thyridopteryx*, Riley—in which I have now seen Mr. Riley's own specimens male and female—the metathorax of female is strongly thorned, while that of the male is unarmed. It is the same with *H. incretus*, Cresson, though I had overlooked the fact from Mr. Cresson's diagnoisis giving the thorns as a *specific*, and not as a *sexual* female character. These two are the only described N. A. *Hemiteles*, were both sexes are known, and the female has thorns on the metathorax: and there is no described male that has these thorns, though I have one such male in my collection. Moreover, in Gravenhorst's genus *Hoplismenus*, which scarcely differs from *Cryptus*, except by the presence of these thorns, the males, according to Brulle, have the methorax unarmed, while that of the female is strongly thorned (*Hymen.* IV. p. 186). Consequently we may infer, with a reasonable degree of probabillty, that in *Hemiteles* these thorns very frequently, but not always, form a sexual character peculiar to females. This is a remarkable and somewhat anomalous fact, because in *Ichneumon morulus*, Say, the female only of which is described by Say, but of which I possess two males, I find that the metathoracic thorns are equally well developed in either sex.

3rd. In *H. thyridopteryx*, Riley, the females has the front wings bifasciate with fuscous, and the male has them hyaline. In *H. incertus* Cresson, the front wings of females are fuscous, and those of males hyaline bifasciate with fuscous. And there is no other described N. A. male with fasciate or bifasciate

wings, nor have I any such in my collection. Hence we may infer that usually, when *Hemiteles* females have the front wings entirely fuscous or banded with fuscous, the males will respectively have them either banded with fuscous or entirely hyaline. Such colorational sexual characters, though very unusual, are not without their parallel in other orders of insects. For instance in *Myodites Walshii*, Lec. *(Coleoptera)*, the wings of males are hayline, and those of females strongly fasciate with fuscous. Conversely in the European *Potamanthus marginatus*, Zetterst. *(Pseudo-neuroptera)*, as I am informed by Dr. Hagen, the front wings of males are tipped with fuscous, and those of females are hyaline immaculate.

4th. Since then in *Hemiteles* metathoracic thorns and fasciate wings, when present—which is by no means universally the case—are usually not a specific but a mere sexual female character, the Synoptical Table which I have given for this genus must be considered as applying exclusively to the female sex.

We may observe here that the body of *H. thyridopteryx* male is very notably darker-colored than that of females. This is the only exception with which I am acquainted to a general colorational law which I have laid down, namely, that in *Ichneumonidæ*, when sexual differences prevail as to the coloration, the male body is almost universally lighter-colored than that of females; whereas in *Tenthredinidæ* the converse rule holds good very generally (*Proc. Ent. Soc. Phil.* VI., p. 239). Until I saw with my own eyes Mr. Riley's specimens, I rather inclined to believe that he must have made some mistake in referring his male and female to the same species. The male of *H. thyridopteryx* is further extremely remarkable for having the stigma perfectly hyaline—a peculiarity which I do not remember to have noticed in any other Ichneumon Fly.

While on this subject I may add, that I do not quite see the force of Mr. Saunders' inferences (*Can. Entom.* II., p. 16) as to the occasional hybernation of the Currant Worm in the larva state. In N. W. New York,—which lies in nearly the same latitude as London, C. W.—this Saw-fly comes out of the ground from the latter part of April to the fore part of May, and the female oviposits shortly afterwards. The earliest flies produced from this laying of eggs appearing about the last week in June. I can see no reason, therefore, why a larva might not have hatched out from the egg in London, C. W., in the first week of May, 1869, spun up on Mr. Saunders' paper bag on May 30, 1869, and the cocoon been noticed by that gentleman for the first time, as he informs us, on May 31st, 1869. Yet Mr. Saunders from these data arrives at the conclusion that such a larva "must have remained unchanged during the winter, and constructed its cocoon after the 22nd of May." In most insects that hybernate under ground there is a considerable variation in the time at which the imago state is assumed in the following spring; and of course the earliest

females will lay the earliest eggs and produce the earliest groups of young larvæ.

The Heteropterous larvæ described by Mr. Saunders (p. 15) as attacking the Currant Worms were not, as he supposes, those of *Stæretrus fimbriatus*, Say., which are quite different but those of some species of *Arma*—perhaps *Spinosa*, Dallas, or *Modesta*, Dallas, or a species closely allied to *Modesta*, which I have found to live in the larval and pupal states in the nests of the Fall Web Worm (*Hyphantria textor*, Harris), preying voraciously upon the inhabitants thereof.

The reader will kindly please to correct the following slips of the pen in the paper to which this forms a sequel :

Page 10, line 2, for "*latter*" read "*former*."
" 10, " 11, " "13" " "14."

NOTES ON HADENA XYLINOIDES.

BY W. SAUNDERS, LONDON, ONT.

On the 17th of June I captured a female specimen of Hadena xylinoides, early in the evening on a sugar cask. Having confined it in a pill box I laid it aside and did not examine it again until the 20th, when it was observed that a number of eggs had been deposited. These, although examined casually by the microscope, I neglected taking a minute description of. They were about medium size, of a flattened conical form, greenish in color, and ornamented many striæ. The eggs hatched on the 24th of June, when the following description of the young larva as seen under a common eye-glass was taken :—

Length 0-12 in., cylindrical. Head rather large, bilobed, black and shining. Body above green and glossy, semi-transparent, with a number of raised brownish dots on each segment, from every one of which arises a brown hair. Second and terminal segments have each a patch of brownish black above under surface similar to upper. Feet blackish brown ; prolegs green tipped with brown.

The middle part of body is arched when walking, the motion resembling that of a Catocala ; the anterior pair of prolegs do not appear to be used in progression. The general appearance, glossiness and semi-transparency of skin reminds one of a Saw-fly larva.

Between the first and second moult another description of the larva was taken. Length 0-32 inch. Head small, bilobed, pale brownish, very transparent.

Body above dull greenish brown along the middle with a reddish tinge at each extremity. 2nd segment above similar in appearance to head. A pale

whitish dorsal line, and a lateral line of the same hue about half way between dorsal line and spiracles. Close to under surface is a faint double whitish line enlarged to a whitish patch at each extremity. 12th segment slightly raised.

Under surface dark dull green along the middle of body; paler with a reddish tinge about each extremity. Feet dark brown; prolegs pale greenish.

After the second moult, July 2nd, the body became much darker in color, and other striking changes were apparent. The head was much larger, and the smooth polished appearance of second segment had almost disappeared. The body above was dull blackish green, almost black on sides, while the whitish lines were about same as before. From the upper lateral line to the dorsal were oblique blackish brown lines meeting on the hinder part of each segment.

On the underside, the 5th, 6th and 7th segments were black with a polished surface, while on the other segments the color was dull blackish green.

I found these creatures quite omnivorous in their appetite, they would feed on almost any green thing, but I fed them chiefly on dandelion leaves and lamb's quarter (Chenopodium album). Having kept them rather closely shut up and crowded they were attacked soon after the second moult by violent diarrhœa, which although I gave them more room and ventilation soon proved fatal to them all. A fortunate circumstance enables me to complete the history of this insect.

On the 5th July, while visiting a friend's garden, I observed a larva feeding on Scabious, which proved to be a nearly full-grown specimen of Xylinoides. The following is its description:—Length 1¼ inches, nearly cylindrical. Head rather small, flat in front, blackish brown and shining, with a few minute hairs scarcely visible without a magnifyer.

Body above black, with a tinge of brown; a broken bluish dorsal line. On each side, close to under surface, is a stripe of brown slightly glossy, dotted with minute bluish white specks appearing like a bloom on the surface. A short whitish yellow lateral stripe on second and part of third segments, and the same on the outer edge of terminal prolegs.

Under surface brown, of the same shade as the lateral stripes above, with a similar bloom. Feet brown and shining; prolegs pale shining brown within, marked with black without.

This larva entered the chrysalis state about the middle of July, forming a rough outer case of leaves, fastened to the cover of the box in which it was confined by silken threads; within this the brown chrysalis was enclosed. The imago appeared on the second of August.

I have also found the chrysalis of this species attached to the under-side of a log early in May.

ENTOMOLOGICAL SOCIETY OF CANADA.

ANNUAL GENERAL MEETING.

The Annual General Meeting of the Society was held, by invitation of the London Branch, in their rooms, City Hall, London, Ont., on Wednesday, the 22nd of Sept., 1869, at 7.30 p. m. William Saunders, Esq., Vice-President, occupied the chair. Owing to the varied attractions and engagements caused by the Provincial Exhibition then being held, the attendance of members was not large.

The Secretary-Treasurer read the minutes of the last meeting, the financial report, and a detailed statement of the condition, present success, and prospects of the CANADIAN ENTOMOLOGIST; on motion they were adopted. Letters of apology for non-attendance from the President, Prof. Croft, Mr. W. Couper, and others, were read, as well as various other communications.

President.—Professor CROFT, D. C. L., University of Toronto.

Vice-Presidents.—E. BAYNES REED, London; B. BILLINGS, Ottawa.

Ex officio Vice-Presidents.—REV. O. BRUNET, President, Quebec Branch; Rev. G. M. INNES, President, London Branch.

Secretary-Treasurer.—Rev. C. J. S. BETHUNE, M. A., Credit, Ont.

Curator.—W. OSLER, B. A., Toronto.

Council.—J. PETTIT, Grimsby; G. J. BOWLES, Secretary, Quebec Branch; W. COUPER, Ottawa.

The following gentlemen were elected Honorary Members:—

Baron R. Von Osten Sacken, Russian Consul General, New York.

Dr. Herman Hagen, Museum of Comparative Zoology, Cambridge, Mass.

Dr. Asa Fitch, State Entomologist of New York.

And the following Corresponding Members:—

Rev. J. G. Morris, D. D., Baltimore, Md.

F. G. Sanborn, Boston Society of Natural History, Boston, Mass.

W. S. M. D'Urban, Albert Memorial Museum, Exeter, England.

The meeting then proceeded to the examination of many rare and interesting specimens exhibited by various members; amongst the most noteworthy may be mentioned a fine specimen of *Catocala relicta*, Walk., taken at Hamilton, by Mr. Mills; *Philampelus pandorus*, Walk. (*satellitia* Harris), raised from larvæ by Mr. Saunders and Mr. Denton; *Catocala polygama*, Guen., from larvæ, by Mr. Reed. Mr. Saunders also exhibited specimens raised from larvæ, of *Thecla inorata*, Grote and Rob.; *Plusia balluca*, Gey., from the hop; a handsome *Tortrix* from thorn, a small species of leaf-roller that is very destructive to pear, plum, cherry and apple trees, specimens of *Nematocampa filamentaria*, Guen., from pear and willow, etc. Mr. Bethune exhibited a collection of *Cicindelidæ*, embracing nearly all the known Canadian

species, several from the United States, and two from Switzerland; some remarkable Australian Hymenoptera and Coleoptera, recently sent out by Mr. Walker; and a number of duplicate Coleoptera which were distributed amongst the members present. Mr. Reed exhibited many interesting specimens of Lepidoptera, including several bred from larvæ.

After spending a few pleasant hours examining specimens and comparing notes, the meeting adjourned.

MISCELLANEOUS NOTES.

EXTENSION OF HABITAT OF PIERIS RAPÆ, LINN.—On the 1st of October I captured a specimen of *P. rapæ*, Linn., on flowers in a salt marsh on the New Jersey side of the Hudson River, less than a mile from this city. It in no wise differed from a European specimen in my collection. This, I believe, is the most southerly point from which the appearance of this butterfly has been yet recorded.—THEODORE L. MEAD, New York.

PIERIS RAPÆ.—The larvæ of this insect were very abundant and injurious this year about Montreal; here they were not numerous, and therefore did little damage.—G. J. BOWLES, Quebec.

MELITÆA PHAETON, CRAM.—I am glad to be able to inform you that I have a brood of *M. phaeton* feeding. They were found by Mr. J. L. Mead, of New York, who has spent some time here this season. He found them within close webs which were attached to *Chelone glabra*, and sometimes to other plants, as Iron-weed [*Veronica*] and a *Solidago*. In one instance a web was attached to the two last named. The larvæ which I have feed on *Chelone;* they appear to feed at night, and during the day collect in dense clusters in the corner of the box in which they live. They are now half an inch long, and marked much as the mature specimens.

Mr. Mead has found the larvæ of another species of Melitæa, quite black, and lying—without a web—upon the under side of the leaves of the plant, a specimen of which I enclose with this. [The plant has been kindly determined for us by Prof. Macoun, of Belleville, as the "*Actinomeris squarrosa*, Nutt., a tall branching plant from 4 to 8 feet high, with the stem winged above. It is common on the western prairies."] These larvæ are difficult to rear, and probably will not be brought to chrysalis state this season. I suppose them to be *M. tharos*, or one of the allied small species.—W. H. EDWARDS, Coalburgh, West Va., September 16th, 1869.

LARVÆ ON ŒNOTHERA.—I was intending to write to you and to Mr. Saunders to-day about the larvæ on the Œnothera, when No. I. of the CAN. ENT. came to hand. I had been watching them for some days and trying to

rear them, as I suspected they were the larvæ of *Alaria florida*, Guen. But I am somewhat puzzled ; I have not found the green caterpillar on the leaves but always on the buds with its head buried, eating into the bud from the outside, and I could not make out whence the animal came ; but Mr. Saunders seems to have found it on the leaves. On examining some of the buds which had a hole in them, and apparently the worm attacks only those just about to blossom, I found on the inside a worm about one-third of the size of the green one ; more of a grey colour and marked almost exactly the same, only much more distinctly,—at least it seems so to me. I did not find this worm in all. Now in what relation do these stand to each other, or are they quite different? The *Alaria* seems fond of sweet-scented flowers ; the only one I had ever taken before this year was on the *Datura Africana*, the perfume of which is almost overpowering.—HENRY CROFT, Univ. College, Toronto, August 16th, 1869. [In reference to the above, which was crowded out of our last issue, Mr. Saunders states that he had also observed this smaller larva in seed pods of *Œnothera* for the first time a few days before the date of Prof. Croft's letter. It was very similar in colour to the larva of *A. florida*, but quite distinct, being *very small*. He has some of them now in chrysalis only quarter of an inch long. He adds that he did not usually find his specimens of *Alaria* feeding on the leaves, but generally with their heads buried in the flower buds, as described by Prof. Croft ; he fed them, however, on both leaves and buds in captivity.—ED.]

COLLECTING GROUND ON LAKE SUPERIOR.—Pie Island in Thunder Bay, Lake Superior, is the best place I know of for Coleoptera. Should any Entomologist go to Thunder Bay, let him by all means visit Pie Island. I am sure I observed 100 species that were new to me when on it, but unfortunately I had no means of collecting.—JOHN MACOUN, Belleville.

CAPTURES.—*Eudamus tityrus*, Sm. Abb. On July 9th, 1869, I captured a fine specimen of this handsome butterfly under an Acacia tree (*Robinia*) on one of our most crowded streets ; it had evidently just emerged from the pupa state, for I caught it with ease in a pill box. This is the second time only that this insect has been taken in London ; the former specimen, caught also on an Acacia tree, is in my cabinet.

Cosmus plagiatus, Walk. (*Xyleutes* of Hubner, according to Grote).—A good specimen, slightly beaten, was brought to me early in July. I think this is the first time it has been taken here.

Callimorpha interrupto-marginata, Beauv.—On July 21st a fine female of this rare insect was brought to me ; it laid a large number of eggs, which, however, failed to produce larvæ. This is a beautiful moth, and when its

wings are folded presents a very extraordinary sight with its distinctly marked cross, which gives it a truly orthodox appearance.

Thecla inorata, Grote & Rob.—I reared some half dozen specimens from larvæ taken on oak.—E. B. REED, London, Ontario.

CAPTURES.—During my stay in Goderich I had hardly the average success. The following is a list of the rarities I have been able to find the names of:—*Cymindis reflexa*, Lec.; *Desmocerus palliatus*, Forst.; *Clytus erythrocephalus*, Oliv.; *C. speciosus*, Say; *Microrhopala interrupta*, and *Epicauta vittata*, Fab.; and of Lepidoptera, *Alypia Langtonii*, Couper; and two species of Ægeria which are new to me.—N. H. COWDRY, Stratford, Ontario.

LUMINOUS LARVÆ.—I send you specimens of luminous larvæ which were plentiful here in August, 1868; they were given me by a gentleman who found them on the Island of Orleans. Can you tell me what they are?—G. J. BOWLES, Quebec. [They are the larvæ of *Phorturis pensylvanica*, De Geer. See CAN ENT. vol. I. p. 39. We were fortunate enough to find a specimen of this larva on the evening of October 2nd, 1869, on the sandy road near the Port Credit Railway Station. It was a warm damp night with occasional showers. —ED.]

INSECTS AT THE PROVINCIAL EXHIBITION.—We are glad to see that our London friends obtained four prizes at the recent Provincial Exhibition held in their city, viz.:—

W. Saunders, 1st Prize for native collection.....	$12 00
Do Extra Prize for foreign "	4 70
E. B. Reed, 3nd Prize for native "	8 00
London Branch of Ent. Soc. Can., Extra Prize for English insects.....	6 00
	$30 00

We understand that the Londoners make a rule of giving the amount of their prizes to the funds of their Branch of the Society; this is a most laudable practice, and we heartily recommend its adoption in other localities, as the Society stands in need of all the money it can get. The following account of this department of the Exhibition we clip from the Toronto *Globe*:—

"In few departments of the Exhibition was there a more noticeable improvement than in that of Natural History, especially in the show of insects, which, this year, embraced the finest collection of butterflies, moths, and beetles ever brought together in the Dominion of Canada. This improvement was entirely due to the exertions of the resident members of the London Branch of the Entomological Society of Canada, who, at the cost of considerable time and labour, had prepared

their private collections for exhibition to the public. The whole number consisted of sixty-three cases, embracing probably two thousand different species, and five or six thousand specimens. They were all neatly arranged in their proper scientific order, and were also labelled in a general way with reference to their beneficial or noxious qualities. The principal collection is the property of Mr. William Saunders, of London, a gentleman who has attained a high reputation among scientific men as a thorough entomologist. It includes twenty-two cases of Canadian insects, and four of foreign species. It is undoubtedly the best private collection in the Dominion, and would be worthy of consideration anywhere. Next to this a collection of English butterflies and moths, the property of the Entomological Society. The case of butterflies included a representative of every British species. The moths were not so complete. These are interesting as objects of comparison with the allied species of this country. Mr. Edmund Baynes Reed, the Local Secretary of the Society, exhibited his private collection of sixteen cases of beetles, butterflies, moths, dragon-flies, &c. Among these are some magnificent specimens. We especially noticed a case of Under-wing moths (*Catocalidæ*), which includes some very beautiful species. The Rev. G. M. Innes, of London, showed seven cases of Canadian butterflies and moths, and an interesting case of specimens of various orders from Labrador, a portion of our country whose natural history has not yet been much investigated. Mr. J. M. Denton, also of London, exhibited nine cases of native insects, some of English butterflies, all in very nice order, and including many fine specimens."

Mounting Small Insects.—I have adopted successfully the following plan of preparing and mounting very small insects for the microscope, such as parasites and acari from birds, beetles, &c. Having procured the parasite alive, I place it on the inside of a sheet of tolerably good note paper, folded, and when in the act of running, I close the paper and press it tightly in a book, which, for want of a better press, I put between two books in my book-case. By this means I find the legs, antennæ, &c., nicely extended, all the expressed moisture absorbed by the paper, and the skin apparently unbroken. I allow it to remain in the book about two days, when it is carefully removed from the paper, put into the turpentine bath, and afterwards mounted in balsam in the usual way.—A. A., F. in *Science Gossip*.

EXCHANGES.

Galls and Gall-Insects.—Galls and Gall-Insects from all parts of the globe are my speciality, and since the lamented death of my friend Mr. Wilson Armistead, of Leeds, († February 18th, 1868,) I am carrying on the researches which he so vigorously started in this field. I shall therefore be happy to enter into correspondence and exchange, or contributions of specimens, with any gentleman in Canada who takes an interest in this particular branch of Entomology—Albert

MULLER (of Basle, Switzerland, but residing now in England), Eaton Cottage, South Norwood, London, S. E., England.

LEPIDOPTERA.—I wish to obtain any North American specimens of *Phalænites*, Latr., especially such forms as are likely to be found in southern New Hampshire or Eastern Mass.; any species of *Urapteryx Acidalia*, *Coremia*, *Cidaria*, and *Boarmia*, will be particularly acceptable. New Canadian species I will describe in the CAN. ENT. I have some 70 specimens of *Hesperia metacomet*, Harris, about equal numbers of both sexes, for exchange.—C. S. MINOT, 39 Court Street, Boston, Mass.

COLEOPTERA.—Species desired from Canada, especially the eastern region; can give in exchange Southern and California forms, as well as those from the New England States.—P. S. SPRAGUE, 227 Broadway, South Boston, Mass.

PHOTOGRAPHS.—An esteemed correspondent writes to us asking, "Is it possible to get up a 'Naturalists' Photo. Exchange Club,' as I am anxious to fill an album with the portraits of my fellow labourers in the field of science?" Should such a thing be practicable, we should be very happy to render any assistance in our power; perhaps some of our correspondents will give us their opinion on the subject. Personally, we should be delighted to fill our album with the *cartes* of all our 'bug-hunting' friends, and should willingly send a copy of our own in return to any who cared to have it.—ED. C. E.

TEXAN INSECTS.—25,000 specimens of insects from Texas, for sale and exchange. G. W. BELFRAGE, Waco, McLennan Co., Texas. Care of Forsgard & Co.

LEPIDOPTERA.—I wish to exchange eggs of *B. Yama-mai*, *Pernyi*, and *Cynthia* for good specimens of *Arctia parthenos*, *A. Americana*, *D. vericolor*, *Theclas Ontario*, *Augustus strigosa*, or almost any exclusively northern species. Correspondence requested.—W. V. ANDREWS, 130 Charlton Street, New York.

TO CORRESPONDENTS.

SUBSCRIPTIONS RECEIVED.—To. vols. I. and II.: From A. M., London, England; J. W. H. R., Yarmouth, N. S. To vol. II.: From H L. M., Malden, Mass.; C. S. M., Boston, Mass.; T L. M., N. Y.; E. P. A, Cambridge, Mass.; F. P. A., do. (per *Am. Ent.*); W. H. E, Coalburgh, Va. Subscription to Packard's *Guide* from B. B., Ottawa.

C. H. B., Rock Island, Ill.—Your first letter enclosing 50 cents, has never reached us. Our rate of subscription is now $1.25 per vol. Money must be at the sender's risk, unless in a registered letter, P. O. order, or Bank draft. The postage to Canada from the U. S. is 6 cents; when only 3 are put on a letter we have to pay 10.

N. H. C., Stratford, Ontario.—Please send a specimen of the *Dacne* that we may be able to determine the species. The pale colour is probably owing to immaturity.

The Canadian Entomologist.

Vol. II. TORONTO, JANUARY 1, 1870. No. 4.

THE ENTOMOLOGICAL SOCIETY OF CANADA.

To day our Society enters with the New Year upon a new phase of existence. Hitherto it has been entirely dependant upon the unaided contributions and voluntary assistance of its members, who, in the very nature of things, are comparatively few in number, and scattered over a wide area of country; now it has received official recognition, and is furnished with such pecuniary aid as will enable it to carry out more effectually the work that it was intended to perform. We trust, then, that all our members will now bestir themselves, and work zealously and actively for the cause of Entomology in this country, and will show by their labours that the encouragement afforded them has been usefully and worthily bestowed. We have now made our first moult, but still continue in a larval state, with all a caterpillar's voracity for food; unless we get plenty we shall shrivel up and die. The sustenance that we require is more members, more work, more books, more specimens, more scientific contributions, more subscribers to our journal, more active co-operation on the part of all!

The following resolution unanimously adopted at the last meeting of the Council of the Agricultural and Arts Association of Ontario, describes our new position:—

"*Resolved*,—That the sum of four hundred dollars be appropriated in aid of the Entomological Society for the ensuing year, on the condition that the Society furnish an Annual Report, and form a Cabinet of Insects, useful or prejudicial to Agriculture and Horticulture, to be placed at the disposal of this Council, and that they also continue to publish their Journal."

This assistance is very timely and acceptable, but it will be observed that it imposes upon us fresh work which will require the active assistance of our members to perform satisfactorily. The Annual Report is intended to be of a practical character and to resemble those issued by the State Entomologists in the United States; notes and observations in economic Entomology from all parts of the country will be especially needed for this. The cabinet of noxious and beneficial insects will also stand in need of contributions from all our mem-

bers everywhere, and will require an entirely distinct arrangement and system from that adopted in the Society's classified collections. Our readers will perceive that this is work for all to do; the humblest beginner, the merest collector, can render valuable assistance in his own way, as well as the more advanced student of the science. Hearty co-operation, regular systematic observation and work are what we require, and what all can render if they choose.

Since our last issue, two regular meetings of the Society have been held in Toronto. At the first, Nov. 10, 1869, in addition to the ordinary routine business, letters were read from Baron Osten Sacken, and Dr. Hagen, acknowledging their election as Honorary Members of the Society, and from Mr. Sanborn and Mr. D'Urban as Corresponding Members; the thanks of the Society were voted to the Boston Society of Natural History, for the donation to the Library of a copy of the "Harris Correspondence;" and a number of specimens of *Buprestidæ* were exhibited by Messrs. Saunders, Reed, and Bethune. At the second meeting, Dec. 14, 1869, the resolution quoted above was read, and the meeting resolved upon accepting the grant of the Agricultural and Arts Association upon the conditions specified. Mr. F. B. Robertson was elected an Ordinary Member; the Secretary announced the much lamented death of Mr. B. D. Walsh, State Entomologist of Illinois, and obituary resolutions of a similar character to those passed at a meeting of the London branch, were adopted.

DEATH OF THE STATE ENTOMOLOGIST OF ILLINOIS.

It is with feelings of very great grief that we record the death of our much esteemed correspondent, Benjamin D. Walsh, M. A., State Entomologist of Illinois. He was walking, it appears, on the railroad track near the depot, at Rock Island, on Friday, Nov. 12th, when a train coming on him unawares, the engine caught his foot and crushed it. The injured limb was amputated, and for several days no great alarm was felt respecting his condition; it soon however, became evident that he had received serious internal injuries, and that there was no hope of his recovery. He lived till the 18th of the month, and then, after much suffering, breathed his last.

No words of ours are needed to tell the reader of the loss science has sustained by this sad accident. One of the most thorough entomologists in America has been taken from us in the full maturity of his powers; the accumulated stores of knowledge gathered during many years of zealous labors in the field, and in the study, have been closed to us for ever. Deeply do we deplore the bereavement, but humbly must we bow in meek submission to the incomprehensible wisdom of an overruling Providence.

The following resolutions respecting this sad event were adopted at a recent meeting of the London Branch of the Entomological Society of Canada:—

"*Resolved.*—That the members of this Society have learned with deep regret of the sudden death of Benjamin D. Walsh, State Entomologist of Illinois. We have long admired his zeal and earnestness in endeavouring to advance entomological science, and we feel that our favourite study has lost in him one of its staunchest supporters and advocates, and those of us who had the privilege of his personal acquaintance, a warm friend. We tender our heartfelt sympathy to his bereaved widow and friends, and assure them that his labour of love manifest in his many valuable contributions to entomological literature will ever be fondly cherished in our memories."

"*Resolved.*—That the Secretary be instructed to transmit copies of the above resolution to the widow of the late B. D. Walsh, and also to the editors of the *American Entomologist* and *Canadian Entomologist*, requesting them to insert the same in their next issues."

A SINGULAR CASE.

Seeing in the last number of the *Canadian Entomologist*, a description of the eggs of *A. Luna*, reminds me to ask of you the explanation of a curious circumstance in the life-history of one bred by me from the larva last year. I will premise that I am writing without my notes, and therefore cannot give *figures* accurately, but can give the facts. There may be nothing very strange about it, but two of the best entomologists in the United States inform me that it is entirely new to them. It is this:—Some time in the latter part of the summer of 1868 I took, feeding on walnut leaves, a mature larva of *A. Luna*, from which I did not hope to rear the mature insect, because I counted on the larva over twenty eggs like those of a *Tachina*. Underneath some of these eggs I could discern with a lens a minute opening through which the fly-larva had entered the body of the *Luna* larva. The skin of the latter was more or less discoloured under each egg, but under some—under many in fact—there was a dense black spot, sometimes two lines in diameter. I made a slight incision in the skin of the *Luna* larva at the place where a *Tachina* larva seemed to have entered by one of the little holes, to see if I could find the *Tachina* larva. It was a very slight incision, as I did not wish to kill the *Luna* larva, but wanted to rear the flies from it to see if they were the same as those bred from *Saturnia Io*. Before it spun up it changed colour, becoming almost pink. It spun up, and to my surprise, instead of producing *Tachinæ*, there last spring emerged from it an unusually large *Luna*. The question which puzzles me is, what became of the parasites? According to all the books, I believe, the entrance of the parasite into the body of its proper host is certain death. Could it have been that the parent *Tachina* made a mistake, and that its progeny, not finding the *Luna* to their taste, died or made their escape? Even if they had died inside the *Luna* larva, must they not have occasioned its death, especially considering the number of them?

I will add that there was no possibility of a mistake, as I had but one other Luna larva, (and it had spun up before I found the infested one, and like it produced a perfect moth, though not so large as that from the infested one), and these were the only two Luna larvæ and the only two Luna moths that I ever saw. I still have both. The infested larva was the last to spin up, but the first to emerge. Can you tell me what became of the Tachinæ?

V. T. CHAMBERS, *Covington, Ky.*

P. S.—Since the above was written, I have referred to my journal, and find that the first larva was taken on Sept. 2; the infested one on Sept. 4. The latter came out on May 6th, and the former on May 15th. Otherwise the facts are as above stated.—V. T. C.

NOTES ON SOME OF THE COMMON SPECIES OF CARABIDÆ, FOUND IN TEMPERATE NORTH AMERICA.

BY PHILIP S. SPRAGUE, BOSTON, MASS.

The many difficulties encountered by those entomologists who have neither time nor access to scientific libraries, but who wish to be more than mere collectors, have induced me to try and assist them, more especially those who are to some extent advanced enough to distinguish many of the families and genera of the Coleoptera. I also hope to be of some assistance to those beginners who have a true love of nature and her works. Yet were I to write for this class only, the *Entomologist* would be more than full for years. My first attempt will be to help the reader to classify some of the more common genera of *Carabidæ*, after which I will refer to the species, pointing out their particular differences by comparative descriptions. I shall endeavor to express myself in familiar phraseology, rather than in technical. To those who have not these instruments, a convenient magnifying glass, Le Conte's 'Classification and List of Coleoptera of N. A.,' are absolutely necessary. (1). I have had prepared a highly magnified drawing of one of our common summer beetles, *Harpalus caliginosus*, to plainly represent all those parts which are of the most importance in classification; the names should be printed with a pen on their appropriate parts, very plainly, that you may know them at a glance. You will find it of the greatest advantage to dissect a number of beetles, of the same and allied genera, comparing the different parts with each other and with the cut, and making drawings of the same, thus familiarizing yourself with the form and parts pertaining to the subject; if you are a new beginner, or have never done this, it is absolutely necessary, and you will be surprised to find how much you have learned with so little trouble (2).

The cut only represents the ventral or under surface. When viewed from above you will find at the extreme anterior part of the head, between the mandibles and covering the mouth, the *Labrum*; a little behind this, at the sides just forward of the eyes, are inserted the *antennæ*. The *head* fits into the *thorax*, which extends to the *elytra*, or wing covers, which are sometimes entire (*Cychrus viduus*), sometimes the true wings beneath are entirely wanting (*Pterostichus permundus*). The small triangular piece at the centre and base of the *thorax* and *elytra* is the *scutel*, the characters of which are not used in the classification of this family. The sexual characteristics are of particular importance, and may usually be known by the greater dilatation of the anterior tarsi of the male. In many genera it is absolutely necessary to have the male to be positive; an instance in point is recorded, Proc. Acad. Nat. Sci. Phil., page 382, Dec., 1868 (3). By reference to Le Conte's Classification you will find the family Carabidæ divided into sub-families, the last of which, *Harpalidæ*, the only one we shall now consider, contains the greater number of the species of *Carabidæ*. This sub-family is divided into tribes, these again into groups, two only of which, *Eurytrichi* and *Harpali*, containing most of the common summer beetles, will be now considered. In these forms we have the following plan of arrangement:—*Ligula* free at the apex, *Paraglossæ* distinct, *Elytra* rounded and sinuate at the tip, anterior and middle tarsi of the male usually broadly dilated,—Harpalini, tribe.

Anterior and middle tarsi of the male usually broadly dilated and covered beneath with a dense brush of hairs,—Eurytrichi, Group. Anterior and middle tarsi of the male usually strongly dilated, and covered beneath with two rows (one on each side) of bristles.—Harpali, Group. As I presupposed in the beginning that you were somewhat acquainted with the different forms of the Genera, you will not confound these with *Pterostichus*, which has in the male only three joints of the anterior tarsi dilated, or with *Chlænius*, which has bright metallic species, usually pubescent, or with *Oodes*, which very much resembles *Harpalus* in form, but differs by having the eighth and ninth elytral striæ confluent and the ocellate punctures very near the margin; this genus is scarce, and not easily distinguished from a number of others, except by those who have had much experience. We will now take into consideration part of the genera embraced in these Groups, remembering, that where they run into one another you will often be puzzled, and must refer to the classification, where the whole subject is carefully elaborated. The Group *Harpali* contains a number of genera, one of which, *Gynandropus*, with but a single species common at the north, is .25 long, quite slender, shining black, thorax much narrower than the elytra, rounded before and behind, and decidedly convex; it resembles both *Pterostichus* and *Stenolophus*, but differs from all other species by the characters of the Group, and by having three rows of punctures on each elytron on the second, fifth and seventh striæ, and by the anterior tarsi having the last joint elongated and

dilated in the female. This last charaeter is of much importance, as we have a division of *Harpalus* having the elytra punctured in three rows ; to you who have this insect named in your collection, the above will enable you to verify it ; to others it is of little importance, as it is one of the more difficult forms to determine. *Bradycellus* has the mentum strongly toothed, but with the exception of the two first species in the list, they are quite small, less than .25 long. The species of *Stenolophus* are also small and slender beetles, with the thorax rounded before and behind, which distinguishes them from *Harpalus*. With a common glass you will make but little progress with the two last named genera, for although they are both quite common, their small size and the excellent paper on *Agonoderus*, *Stenolophus* and *Bradycellus* (which is as perfect as the long experience of our greatest American Entomologist can make it), renders it undesirable to treat of them in this paper. There is a division of the Genus *Harpalus (Selenophorus)* which, as Dr. Le Conte says, should be a separate genus, and which has the paraglossa flat, longer than the ligula, without lateral bristles, and the ligula is narrow, not dilated at the tip. Nearly all of this division are small and oval, having the form of the smaller common *Amaræ*, but have three rows of punctures on each elytron; only two species are commonly found at the north, *H. gagatinus* and *H. iripennis*, which resemble in general form the true *Harpalus*, having the paraglossæ rather thick, not longer than the ligula, and furnished at the sides with a few bristles; the ligula is truncate; they are mostly of medium or large size, and are found in the middle of summer; the mentum tooth is usually wanting, or quite small, except in three or four species, which are quite rare and inhabit the extreme west. The thorax is sub-quadrate (nearly square) ; the proportions of this part of the insect are quite deceptive, it appearing much longer than it really is, therefore you should measure it accurately until your eyes are familiar with this seeming difference. These beetles are rather broad and oval, varying from brown to black; two or three of the species are metallic green, more or less shining. The anterior and middle tarsi of the male are dilated, covered beneath with two rows of squamiform papillae. The posterior tarsi of the male are like all of those of the female. Some have the elytra reticulate in both sexes, others in the female only. The apex of the elytra of the female in some species is prolonged into a short spine called the sutural spine, as it is a prolongation of the suture.

In my next paper I shall commence the description of the species, having given you here an outline of the genera.

1. The Watchmakers' common jewelling glass, having two lenses of about a half-inch focus, will answer for all but the most minute forms. It costs less than one dollar, U. S. The Smithsonian Classification of the Coleoptera of N. A., by John L. Le Conte, M. D., 1861-1862, and the List of Coleoptera of N. A., 1863-1865, are indispensable ; be particular to get the latest edition; these pamphlets can be had at the Naturalists' Book Agency, Salem, Mass.

2. A cheap and convenient dissecting board, which will answer all requirements, can be made by taking a smooth piece of board, one inch thick, 8 × 12 inch, glueing to the middle a piece of soft wood or cork, about two inches square, one-half thick; put up a standard three inches high on one side of the board near the middle; next twist a small piece of auncaled wire around your eye-glass, leaving one end long enough to pass around or through the side of the standard, thus bringing your glass over the centre of the board; the wire can then be bent so as to have the focus come where you please. Cover the small centre piece with white paper; on this you can pin or glue the specimen as you please, and now, with your glass in position, you have both hands to work with. Take two or more pieces of wood like the small tip of a penholder; force a fine needle into the end of each; heat the points in a flame, and by quickly pressing them against a piece of iron or glass you have a set of dissecting hooks; with these you can hold the insect and separate the various parts.

3. Proc. Acad. Nat. Sci. Phil., page 382, Dec., 1868.—*Bradycellus (Geobænus) arenarius* Lec. "is proved by the discovery of the male to belong to the genus *Amara*." Therefore, those having this beetle named *Bradycellus* must change the label to *Amara*.

4. This valuable paper, which is advertised under the title of "Species of *Baridius* of U. S., 1868," can be had at the Naturalists' Book Agency, Salem, Mass., Price 10 cts., postage U. S. 2 cents.

THE CURRANT WORM AGAIN.

BY W. SAUNDERS, LONDON, ONT.

In the last number of the *Entomologist* our late esteemed friend, Mr. B. D. Walsh, whose sudden death we most deeply deplore, calls in question the correctness of my inference regarding the occasional hybernation of the currant worm, intimating that my conclusions were based upon insufficient data. He says, "I can see no reason why a larva might not have hatched out from the egg in London, C. W., in the first week in May, 1869, spun up on Mr. Saunders' paper bag on May 30th, 1869, and the cocoon been noticed by that gentleman for the first time, as he informs us, May 30th, 1869. Yet Mr. S. from these data arrives at the conclusion that such a larva *must* have remained

unchanged during the winter and constructed its cocoon after the 22nd of May."

I am sure our much lamented friend must have overlooked one portion of the paragraph to which he refers, which was written with the express intention of removing such an objection as he urges, should it arise. I there stated that on the 22nd of May I was trying some experiments in crossing gooseberries—fertilizing the flowers of the Houghton seedling with pollen from some of the English varieties. Anyone who has thought for a moment on this subject will see that to ensure success in hybridization, it is necessary to open the flowers before they are ready to burst of themselves and remove the male organs before the pollen is fully matured, so as to prevent natural impregnation; and also to avoid another source of danger, that of the carrying of pollen by insects from other flowers and its deposition on the stigma of the flower on which you wish to operate. It is well known by those who have cultivated the gooseberry that the flowers are open before the leaves are fully expanded, and that the whole process, from the bursting of the buds to the opening of the flowers, is accomplished in a very short time—usually, I think, within five or six days. I believe that all entomologists agree that the eggs of the saw fly are *invariably* laid on the under side of the leaves, and usually attached to the larger veins. On the date before referred to, the 22nd of May, as the flowers were not then open, there would be scarcely a leaf on the bush sufficiently developed to serve the purpose of the female fly as a resting place for her eggs, and yet nine days after this the cocoon was found attached to the paper bag, and quite firm in its texture, as if it might have placed itself there several days before. From 10 to 14 days would probably elapse from the time of depositing the egg to the appearance of the young larva, and two weeks more, at least—perhaps three—would be required to bring it to its full growth. This work of a month or five weeks could not possibly have been crowded into the space of eight days or less, and I think I can scarcely be accused of rashness in forming the conclusion I did, that in this instance the larva *must* have remained unchanged during the winter, probably under the surface of the ground, then crawled up the bush, attaching itself to the paper bag, and there constructing its cocoon some time between the 22nd and 30th of May.

The hemipterous insect Mr. Walsh refers to in the closing paragraph of his paper I have succeeded in rearing. It is not yet determined, but as far as I can learn, is distinct from either of the species referred to by myself or Mr. Walsh; as soon as it is correctly determined I shall give its name publicity.

REMARKS ON THE HISTORY AND ARCHITECTURE OF THE WOOD PAPER-MAKING WASPS.

BY WILLIAM COUPER, OTTAWA, ONT.

The history of the wasps of temperate America has not been recorded. It appears that entomologists have no great desire to study those interesting insects; and although several species occur in Canada, we know little or nothing of their natural history. One species, the spotted wood wasp (*Vespa maculata*, Linn.), occurs commonly, as near as I can determine, about every third year, in our northern woods. Having partially studied its habits, and collected a series of the nests in all their stages, it is particularly in regard to the latter that I claim attention. But before I proceed to relate what I have ascertained regarding their architecture, it will suffice to state that each large nest which we notice suspended from trees towards the end of summer consisted of a colony of males, females and workers, or imperfect females, as they are termed. The large nest is certainly the second, probably the third structure which has been formed by an industrious colony of workers during the warm months of summer. In this latitude, late in the fall and early in spring, we find large and small females in a torpid state. They are the generators of the forthcoming colonies, and the only living remnant of the large number of distinct individuals which inhabited one of the deserted nests of the previous season. These females leave the nest on the approach of cold weather in October, or according to the latitude where they occur, and they then carry impregnated ovaries from which are produced eggs to constitute a young colony of from eight to twelve workers in the following spring. The gradual warmth, generally in the early part of May, awakens the torpid female, and she emerges from her winter's abode to perpetuate her species. After partaking of such food as can be procured at this season, she is now prepared to fulfil another part of her mission—instinct teaches her that she must be her own builder—and for this purpose she goes forth to select a suitable sheltered situation. When this is found, she collects and prepares woody fibre from weather-worn fences, &c., by which, in the course of a week or ten days, she forms a little pretty spherical paper nest. After it is perfected, she attaches a single tier of hexagonal cells, in each of which an egg is deposited. The first egg is placed in the central cell, and as far as I have been able to watch the parent, and from examination of several of these small nests, I am of the opinion that she does not deposit all her eggs simultaneously, but that there is a lapse of time between the deposition of each egg. I am led to this conclusion because in several nests which I have examined larvae occupied the central cells, while some of the surrounding ones contained eggs; besides, I have ascertained that the young workers issue from their cells at stated periods, one after another. Here, then, we

see a beautiful provision Providence has made for the perpetuity of what we look upon as an insignificant wasp. It has been provided with instinct to guide her; indeed, it appears to me that she has a kind of understanding that her progeny are to be brought forth gradually, therefore she only deposits a single egg at a time, when a lapse of a day or more occurs between each, which is no doubt caused in order that her labor in the collecting of food (for they are ravenous eaters in their larval state) may be brought about with greater facility, or, correctly speaking, that the time for procuring food and watching the nest will be equally divided. She is therefore only compelled to feed two at a time; and by the period of the issue of larvæ from advanced eggs, the first two have ceased to feed and are no more trouble to her, as they are prepared to spin cocoons to enclose themselves in their cells to undergo the third stage of their life. The parent wasp has also the accuracy and knowledge of a bird in regard to the locality of its nest; indeed, the attachment is as great, and which is not abandoned until it is deserted by her progeny to construct the second. I have had the pleasure of watching the formation of the parent nests of *Vespa maculata* and *germanica* from the time they were commenced until completion, and I now record a difference in their mode of working from the European *V. vulgaris* or its American representative, *i. e.*, that the pedicel and the tier of cells are the last portions of the work finished. In some rare examples, the inner dome and part of the second exterior envelope are not fully completed when the pedicel and tier of cells is attached to the roof; but there may be a force of nature in these deviations from the general plan of architecture, which I am not prepared to solve. Kirby says: "That the common wasp of Europe (*Vespa vulgaris*, Linn.) only partially completes the dome before the uppermost tier of cells are begun, and when the first tier is finished, the continuation of the roof or walls of the building is brought down lower; a new tier of cells is erected, and this work successively proceeds until the whole is finished."—*Introduction to Entomology*, Vol. I., p. 504-5. The first and second nests of *V. maculata* and *germanica*, with the exception of the rare specimens before mentioned, are not formed in this manner, for all those which I have examined had their exterior covering and the aperture fully formed before the first or second tiers of cells were commenced. In order to confirm my former statement that the parent nest is abandoned by the first issue of wasps, and that it is not enlarged, as many people suppose, one of these little nests was found occupying the full extent of a cavity in an old tree stump. It contained a single tier of eighteen perfect cells, which I believe is the maximum number of the parent nest. They are found from one and a half to three inches in diameter, and contain from one to four partitions or envelopes. These distinctions may be attributed to the bulk and strength of the parent architect—for I find a great difference in the size of hibernal females—one found under bark of a tree at Quebec, on the 20th of May, measured seven-eighths of an inch, and two others which I found under decayed leaves in the

woods near Ottawa measured five-eights of an inch in length. There is some motive for these varied proportions which as yet requires explanation. *Vespa maculata* invariably suspends its nest from the branches of beech and maple trees. These may be found common during some seasons between the months of July and October. The structural conformity of those of the second colony are remarkable from being only about half the size of the third—for there cannot be a doubt on my mind but that *maculata* constructs a third—and that is the large nest we find in the fall of the year, and the one in which the males are produced. It is during the season that the second form of nest is inhabited that these insects should be watched, and I am sorry that I have not had that opportunity, as I should have determined the existence or not of males at this period.

The parent wasps are very fond of building their nests in the neighborhood of our dwellings. Sometimes they are found attached to sheltered situations in out-houses, and their object in selecting these situations is no doubt to be close to localities where they can procure food to rear their young quickly. The entomologist may look for these little nests early in May; thenceforward he can find them in all stages of progress, but few will be found containing eggs before the 25th of May, which is about the time that the first egg is deposited. Larvae appear about the 7th of June. *Vespa maculata* was the species prevalent in the woods near this city in the summer of 1868. Last year *Vespa germanica* was predominant, and I append two or three notes regarding them.

May 30th—Found a nest of *V. germanica* under a piece of old bark, on the ground. Appearance of nest similar to that of *V. maculata*. There was only one egg in the central cell.

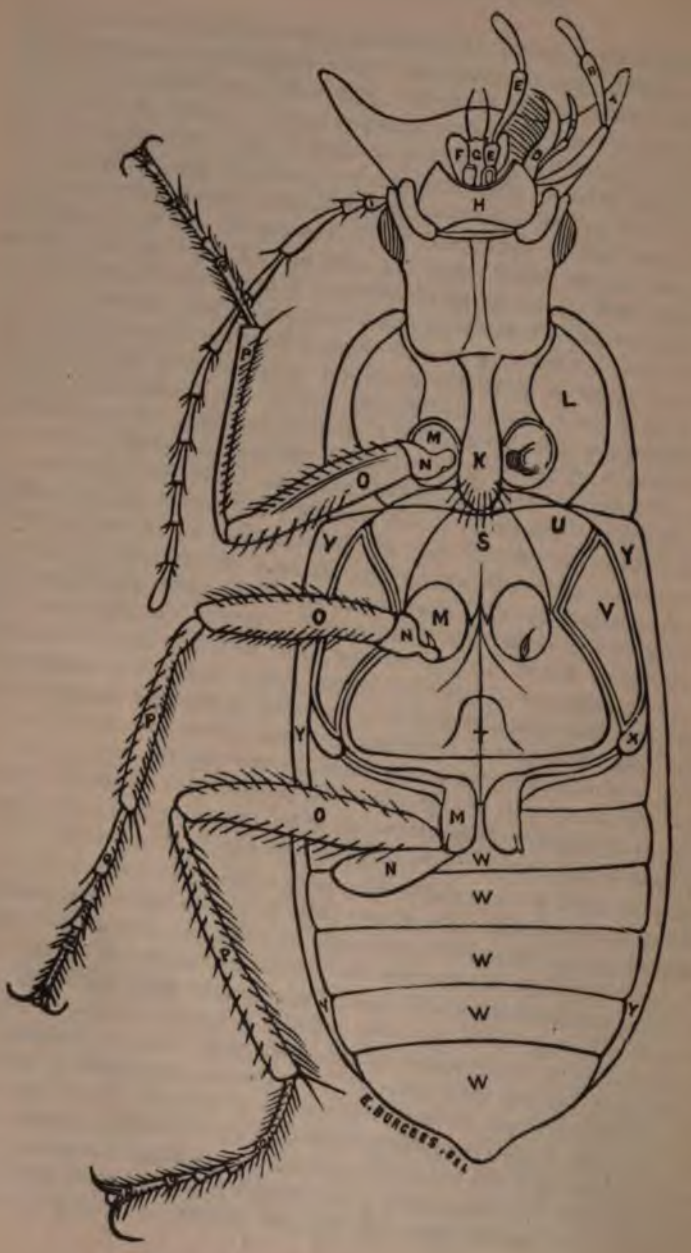
June 7th—Found a second nest of *V. germanica*. It contained twelve cells, ten of which had eggs, and the two central contained larvæ, apparently hatched a few days previous. The eggs are attached to the inner wall at the bottom of each cell. This nest had three partitions of similar construction to that of *V. maculata*.

June 13th—Examined the nest found on the 30th ultimo. It appeared to have been increased by an additional envelope. In taking up the piece of bark and holding the aperture so that the rays of the sun could enter it, I detected larvae in the central cells, but they were very small. When I first found this nest, the parent came out and flew about my head, but on this occasion I had to blow into the aperture ere she came out, and when she did there was no fear exhibited, nor did she fly away, but stood on the outside of the wall while I examined the interior.

One part of the history of this species, I am sorry to say, I have not had an opportunity to investigate—that is, their economy while in the second nest, for I believe that it is during this stage of progress that a true account of the individuals which constitute the colony can be determined. Here we could, no

doubt, arrive at some conclusion regarding the correct dates of the appearance of the sexes which are said to occur towards the autumn. Reaumer states that there are two sizes among the males. It would be interesting to know if they are permanent kinds. Kirby, and other writers on Insects (see Westwood's Int. to the Modern Class. of Insects) state that the neuters, or what are now termed undeveloped females, "massacre the later brood of larvae which are not able to undergo their transformation before the setting in of the winter." This may, no doubt, be the end of the later larvae of the two species here spoken of, but it is not the case with the pupae which occupy the cells of *V. maculata* in the autumn, as I procured living specimens from nests brought home in October. The second nest of *V. germanica* contains two tiers of cells, which are generally enveloped with six or more partitions. During the warm season in which it is occupied, proper ventilation is necessary to insure the health and increase of the colony; therefore the wasps never neglect this important mode by which the interior is kept at an equal temperature. The innermost partition encircles the double tier of cells, but its aperture is larger than the next outermost, and the aperture of each decreases towards the exterior one until it is only of sufficient size to admit one or two insects. In order that pure air be properly obtained, and that the circulation should be sufficient to force foul air from the interior, we find other apertures on the exterior partition, which lead in zigzag passages from one partition to another until they reach the interior. This mode of ventilation is beautifully illustrated in the large autumnal nests, and for a good reason, we generally find them containing from four to five tiers of cells and a numerous colony, which obtains its full strength in this nest. In a nest lately examined the latter number of tiers was found; the two uppermost consisted of small cells, and those of the two central were of larger dimension, and had been evidently occupied by males and females, while the fifth or lowermost tier does not appear to have been occupied; but it is nevertheless curious *that it agrees in size, number and form of cells to that found in the parent nest in spring.*

Notwithstanding the powerful sting with which some of them are provided, wasps are liable to the attacks of other insects, and their nests are entered by parasites belonging to the orders of Coleoptera, Hymenoptera and Diptera, for the purpose of depositing their eggs in the cells containing the larvæ. Nests of the second and third colonies which I took from branches about fourteen feet from the ground, at the end of October, 1868, are infested with a Hymenopterous parasite. One of these species issued from a cell of *maculata* about six days after it was in my possession. Five came from one cell. I sent this Hymenopter to Mr. Cresson, of Philadelphia, and he has since described it as a new species, *Euceros burrus* (*Canadian Entomologist*, i., p. 104). This parasite occupied a longitudinal position in the cell of the wasp, and its cocoons were slightly made, and stood side by side. I also remarked that they issued from a cell which was covered with the cap which is generally spun by the



HARPALUS CALIGINOSUS, Say. ♀.

PARTS OF CUT.

Ventral surface of *Harpalus caliginosus*.

A	Mandible.	K	Prosternum.	S	Mesosternum.
B	Maxillary palpus.	L	Episternum of prothorax.	T	Metasternum.
C	Outer lobe of maxilla.	M	Coxæ.	U	Episternum of mesothorax.
D	Inner lobe of maxilla.	N	Trochanter.	V	Episternum of metathorax.
E	Labial palpus.	O	Femora.	W	Ventral segments.
F	Paraglossæ.	P	Tibiæ.	X	Epimeron of metathorax.
G	Ligula.	Q	Tarsi.	Y	Epipleura.
H	Mentum.	R	Ungues.		
I	Antenna.				

EXPLANATION OF TERMS.

Base—That point of any organ nearest the centre of the insect.
Apex—That point of any organ farthest from the centre of the insect.
Dorsal—Upper surface.
Ventral—Under surface.
Emarginate—Sharp indentation.

Sinuate—Curved indentation.

Lateral—Pertaining to the sides.

Marginate—With the edge surrounded by a border.

Truncate—Squarely cut.

Transverse—Crosswise.

Obtuse—Rounded, not acute.

Acute—Pointed.

Thorax—Usually the dorsal surface between the head and elytra.

Prothorax—Usually the ventral surface to which the anterior legs are attached.

Mesothorax—That part to which the middle legs are attached.

Metathorax—That part to which the posterior legs are attached.

Elytra—The wing covers.

Elytral striæ—Longitudinal grooves in wing covers.

Elytral interstices—Spaces between the striæ.

Elytral dorsal punctures—Small impressions usually between the first and third striæ.

Scutel—Triangular piece at the base of the suture of wing covers.

Scutellar striæ—Abbreviated striæ each side of the scutel.

Suture—The longitudinal line of juncture between the wing covers.

Sutural stria—The groove next to the suture.

Rugose—Wrinkled.

Sulcate—Broad shallow groove.

Fovea—Large impression.

Connate—Joined together.

Reticulate—Covered with lines intersecting each other like a net.

wasp larva prior to its changing into a pupa. Therefore I think that *E. burrus* is a wasp pupa parasite. There are at present cocoons of what I take to be another species occupying about two-thirds of the cells of a nest of *Vespa maculata*, but differently shaped from the cocoons of *E. burrus*, being generally triangular in shape externally, but having an interior cocoon occupied at present with the larva. The curious shaped cocoons, of chestnut color, are all situated at the bottom of the cells, and only in those cells which are open, but having the larval lining to the walls of the cells, and in every instance uncovered. For this reason I believe that this parasitic larva, which has now lain in cocoon since October, 1868, and is not yet developed into the perfect insect, is probably a wasp larvæ parasite, and they illustrate what entomologists term "the metropolis of a species." When they issue, we may conclude it to be their prolific year.

LIST OF COLEOPTERA.

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 18.)

GYRINIDÆ.

GYRINUS, *Linn.*
*Picipes, *Aubé.*
*Ventralis, *Kirby.*
*Analis, *Say.*
*Aeneolus, *Lec.*
Fraternus, *Couper.*
*Lugens, *Zimm.*
*Limbatus, *Say.*[1]

DINEUTES, *McLeay.*
Americanus, *Linn.*
*Carolinus, *Lec.*

HYDROPHILIDÆ.

HELOPHORUS, *Fab.*
Lacustris, *Lec.*
Lineatus, *Say.*
Scaber, *Lec.*

HYDROCHUS, *Germ.*
Squamifer, *Lec.*
*Excavatus, *Lec.*
*Simplex, *Lec.*

HYDRÆNA, *Klug.*
*Pensylvanica, *Kies.*
HYDROPHILUS, *Geoff.*
Triangularis, *Say.*

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*Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

[1]From Canada East.

HYDROPHILUS, *Geoff. cont.*
Lateralis, *Hbst.*
*Ovalis, *Zieg.*[2]
HYDROCHARIS, *Latr.*
Obtusatus, *Say.*
BEROSUS, *Leach.*
Striatus, *Say.*
LACCOBIUS, *Er.*
Agilis, *Rand.*
HYDROBIUS, *Leach.*
*Insculptus, *Lec.*
*Digestus, *Lec.*
*Subcupreus, *Say.*
PHILHYDRUS, *Sol.*
*Fimbriatus, *Mels.*
*Maculicollis, *(Muls).*
*Nebulosus, *Say.*
Perplexus, *Lec.*
Ochraceus, *Mels.*
Cinctus, *Say.*
*Bifidus, *Lec.*
CERCYON, *Leach.*
Flavipes, *Er.*
*Prætextatum, *Muls.*
CRYPTOPLEURUM, *Muls.*
Vagans, *Lec.*

SILPHIDÆ.

NECROPHORUS, *Fab.*
Marginatus, *Fab.*
Pustulatus, *Herschel.*
Mortuorum, *Fab.*
*Pygmæus, *Kirby.*[3]
Orbicollis, *Say.*
Sayi, *Lap.* (lunatus *Lec.*)
Velutinus, *Fab.*
Obscurus, *Kirby.*
SILPHA, *Linn.*
Surinamensis, *Fab.*
Lapponica, *Hbst.*
Marginalis, *Fab.*
Inæqualis, *Fab.*
Peltata, *Catesby.*
NECROPHILUS, *Latr.*
*Subterraneus, *Fab.*
CATOPS, *Fab.*
Opacus, *Say.*
*Terminans, *Lec.*
*Parasitus, *Lec.*
ANISOTOMA, *Ill.*
Obsoleta, *Lec.*
LIODES, *Latr.*
Globosa, *Lec.*
*Polita, *Lec.*
*Dichroa, *Lec.*
AGATHIDIUM, *Ill.*
*Oniscoides, *Beauv.*
Exiguum, *Mels.*
Revolveus, *Lec.*

SCYDMÆNIDÆ.

SCYDMÆNUS, *Latr.*
*Fossiger, *Lec.*
*Capillosulus, *Lec.*
*Basalis, *Lec.*
Rasus, *Lec.*

PSELAPHIDÆ—(BRENDEL'S SYNOPSIS).

CTENISTES, *Reich.*
*Piceus, *Lec.*
BRYAXIS, *Leach.*
*Perforata, *Brend.*
*Illinoisensis, *Brend.*
Rubicunda, *Aubé.*
DECARTHRON, *Brend.*
*Abnorme, *Lec.*
BATRISUS, *Aubé.*
*Lineaticollis, *Aubé.*
EUPLECTUS, *Leach.*
*Confluens, *Lec.*
RHEXIUS, *Lec.*
*Insculptus, *Lec.*

(To be Continued.)

MISCELLANEOUS NOTES.

PIERIS RAPÆ, Linn.—In your "Miscellaneous Notes" of Nov. 15, your correspondent, T. L. Mead, of New York, speaks of having captured "a specimen of *P. rapæ* on flowers in a salt marsh on the New Jersey side of the

[2] A single specimen taken several years ago on the shore of the Lake, only lately identified.

[3] Dr. Le Conte, in his List, has placed *N. pygmæus*, Kirby, as a synonym of *N. mortuorum*, Fab., but, as Dr. Horn informs me, now considers them distinct. A fine specimen of the variety *crispetus*, Motsch, was taken here by Dr. Milward.

Hudson River." If he had 'hunted' the 'Hill' on which Hudson City stands, instead of the 'salt marsh' at its foot, he might have captured a hundred specimens instead of *one*. The increase of this insect during the last two years is marvellous.—W. V. ANDREWS, New York.

LIMENITIS PROSERPINA, Edw.—Mr. J. M. Jones sent us a coloured drawing of a specimen captured near Halifax, Nova Scotia, which we consider to be a specimen of *L. proserpina* Edw. We sent the drawing, however, to Mr. Edwards, the highest authority, who replied as follows:—"I think the figure is of *Proserpina*; the white band is rather unusually broad on the upper surface, but no two of the specimens I have seen are alike in this respect. If you examine a series of *Arthemis* you will notice a large range of variation *in all respects*, and probably *Proserpina* varies as much."—C. J. S. B.

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The American Naturalist. Vol. iii., Nos. 8, 9 and 10. Salem, Mass.
The American Entomologist. Vol. ii., Nos. 1 and 2. St. Louis, Mo.
The American Agriculturist. New York.
The Canada Farmer. Toronto.
The Maine Farmer. Augusta, Me.
The (Weekly) N. Y. Sun. New York.
Proceedings of the Boston Soc. Nat. Hist. Vol. xiii., pages 1 to 160.
The Educator. London, Ont. Vol. ii., No. 12. An illustrated monthly.

TO CORRESPONDENTS.

W. V. A., New York.—Your subscription to vol. ii. was duly received and put to your credit; by an oversight it was omitted from the list of acknowledgments. You were quite right in sending $1.25; $1 is the price in *gold*, the basis of our Canadian currency.

Back Numbers.—In answer to numerous enquiries we beg to state that we can supply a limited number of copies of our *first* volume, neatly bound in the wrapper, for one dollar each. We have also plenty of copies of all the numbers from the beginning except Nos. 1, 3 and 4 of vol. i.; we shall gladly pay ten cents a piece for copies of any of these three numbers sent to us in good order.

S. H., Boston.—We have a few feet left of the extra thick cork, at 24 cents per square foot, but none of the ordinary thickness. We shall get a fresh supply of the latter from England shortly.

Pins.—We have still on hand a quantity ef Klaeger's entomological pins, Nos. 4, 5 and 6, price 50 cents (gold) per packet of 500. These are the coarser sizes; we have ordered a fresh supply of Nos. 1, 2 and 3.

Subscriptions.—Members of the Society are reminded that their subscriptions for the year 1870 ($2) are now due.

Donation.—Mr. J. Pettit, of Grimsby, in making a remittance, kindly presented the balance, $2.25, to the publication fund.

*** In future we shall acknowledge subscriptions to the *Canadian Entomologist* by enclosing a receipt for the amount received in the subscriber's copy, as the law permits, instead of in our pages as heretofore.

We crave the indulgence of many of our correspondents for having permitted their letters to remain so long unanswered. Entomology is with us a labour of love; other, and more pressing and important duties frequently prevent our devoting to it as much time as we would.

Club Rates.—In addition to the club rates announced on the second page of the wrapper, we are enabled to offer the following:—

The *American Agriculturist* ($1.50) and the *Canadian Entomologist* ($1) for $2.00.

Once a Month ($2) and the *Canadian Entomologist* ($1) for $2.25.

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The *Children's Hour* ($1.25) and the *Canadian Entomologist* ($1) for $1.75.

The *Educator* (36 cents) and the *Canadian Entomologist* ($1) for $1.05.

The Canadian Entomologist.

Vol. II. TORONTO, MARCH 1, 1870. No. 5.

NOTES ON SOME OF THE COMMON SPECIES OF CARABIDÆ, FOUND IN TEMPERATE NORTH AMERICA.

BY PHILIP S. SPRAGUE, BOSTON, MASS.

ARTICLE NO. II.

In my previous article upon this subject, I treated upon the classification and the particular distinguishing characters of the genus *Harpalus*; in this I wish to call attention to their specific differences, by noting those variations of form or structure which are so constant as to cause us to consider them as denoting distinct species. The general form of the beetles of this genus is oblong-oval, rather broad, thorax quadrate and in length from .30–1 inch, black piceous, shining. Our northern exceptions to this color are *H. viridiaeneus*, Beauv., and *H. erraticus*, Say, the former being bright brassy green, the latter dark ferruginous or the colour of immaturity. The cut accompanying the previous article was of *Harpalus caliginosus*, Say, a beetle so well known that I shall describe it in detail, that you may better understand my ideas in describing others. I shall suppose that you have taken up this beetle without any previous knowledge of its name; you perceive it has the general form of the genus *Harpalus*. We now proceed to examine the anterior and middle tarsi, the four first joints of which are strongly dilated, consequently it is a male, beneath they have at the sides a few coarse short bristles (had they been covered with a dense brush of hair, we should have laid it aside as most likely belonging to the genus *Anisodactylus*), its length from the apex of labrum to the end of the elytra is .90 (.80–1.05 are the extremes of specimens in my collection), width .35. If we now had access to descriptions of the beetles of this genus, we should find only one of this length or near it, consequently without further trouble we should only have to see that it agreed with the specific description. This is the largest *Harpalus* we have, being one-half longer than any other, and if the generic characters are well worked up, it cannot be mistaken for any other. The head is black with a few scattered punctures, nearly obsolete, the frontal impressions between the antennæ are well marked, apex of labrum

slightly emarginate at centre ; mouth, tarsi and antennæ reddish brown, the latter with the two basal joints smooth ; thorax nearly twice as wide as the head and much wider than long, finely punctured, confluently at the base and near the apex, sparsely at the centre on top, the dorsal longitudinal line distinct, abbreviated in front, sides depressed and flattened, making a wide margin which is punctured, it is narrow at the apical angle and very broad at the base, there is a very narrow raised border at the edge, on each side between the middle and margin a little inward from the base is a broad shallow fovea (basal fovea), more roughly punctured than the other parts, the sides are narrowed and rather broadly rounded forward from a little behind the middle, and sinuated posteriorly, the basal angles are acute with the apex pointed and somewhat extended outwards ; elytra broader than the thorax, oval, with its greatest width near the middle, the apex is obliquely and slightly sinuated, the striæ are deep, very finely and rather sparsely punctured, interstices convex, no dorsal puncture ; beneath dark piceous, punctured at the sides, mentum not toothed, on the abdominal segments beneath, each side of the centre, are seen a row of punctures from which a long bristle projects (ambulatorial setæ). I wish to call your attention to this marking for we have those with another set of setæ nearer the sides of the abdomen and called accessory ambulatorial setæ. The great length and breadth of this beetle distinguish it from all others of the genus, and I know of no beetle that it can be taken for.

During the middle of summer, under stones and boards in sandy soil near running water, beetles are found quite commonly, having the appearance of being immature in color ; this is *Harpalus erraticus*, Say. Long ·60 (·50–·68). Testaceous beneath, darker above with the elytra piceous, more slender than the preceding. Head smooth, frontal impressions shallow, antennæ concolorous, with the two basal joints smooth ; thorax smooth, with the sides depressed, leaving a wide margin suddenly and broadly dilated behind, finely punctured, the basal foveæ are distinct and usually punctured, sides rounded forward of the middle and strongly narrowed behind but not rounded, basal angles obtuse, scarcely rounded at the extreme apex ; elytra much wider than the base of thorax, sub-oval, deeply and obliquely sinuate at tip, in the ♀ the outer angle acute and dentiform, the extreme apex is sometimes sub-sinuate, leaving a sutural spine, the striæ are moderately deep and impunctured, it has no dorsal punctures ; the abdomen beneath is finely punctured and pubescent at base. In most examples of this species a slight sinuation of the thorax is seen on each side, about one-third of its length from the base, in some the basal fovæ are scarcely punctured, making the whole thorax nearly smooth. I have in my collection one

specimen which is wholly dark piceous, almost black, with the exception of the outer joints of the antennæ, which are covered with fuscous hairs. This beetle differs from all other species of Harpalus (except *H. retractus*, Lec., from New Mexico, which I have never seen), by the deep and peculiar sinuation of the apex of elytra and also by its immature color.

Harpalus testaceus, Lec.—Iowa and Illinois—must be similar in color, but is much smaller, long .41, and also differs by belonging to the subdivision having accessory ambulatorial setæ. I presume from the fact that I never have obtained this beetle in my many western exchanges, that it is quite rare.

Harpalus viridiaeneus, Beauv., length ·40 (·32.42). Beneath black, above bright metallic green, more or less bronzed, sometimes coppery, rarely black; epipleurae, legs, mouth and antennæ reddish-brown; head smooth, nearly black and darker than the thorax, which is a little wider than long, sides narrowed behind but not depressed, showing only the narrow border which is distinct wholly around the thorax, its basal foveæ shallow, somewhat linear, and with the angles and base punctured, posterior angles obtuse and very slightly rounded at the extreme apex; elytra wider than the thorax, with the sides finely punctured and pubescent, striæ not deep, and in some specimens nearly obsolete punctures may be seen, interstices flat, the apex is obliquely and strongly sinuate, in the ♀ the outer angle acute, no dorsal puncture. The color of this beetle marks it well, and with the apical sinuation of the elytra quite distinguishes it from others of the genus.

Harpalus amputatus, Say. Dr. LeConte refers to a beetle somewhat resembling the above (Pro. Acad. Nat. Sci., Philadelphia, page 99, 1865), as coming from Kansas, New Mexico, Saskatchewan, Montreal, Canada, which I will describe, hoping that others may have been more fortunate than myself in procuring it from this section. The only specimens I have seen were from New Mexico, one of which by the kindness of Mr. G. D. Smith, of this city, I have in my collection. Dr. LeConte says (loc. cit.) "above metallic blue or green, nearly black, with the apex of elytra truncate." Three of the four specimens I have examined are nearly black, with the faintest tint of dark blue, and only one was brassy green. The following is a description:—Length ·38 (·37–41). Above and below nearly black, shining, legs and antennæ piceous. Head smooth; the thorax at the sides broadly rounded before and behind, basal angles nearly obsolete, sides of thorax not depressed, basal foveæ shallow, with the outer angles somewhat flattened and punctured; elytra broader than thorax with the apex nearly squarely cut off, striæ well marked, the ♀ with sutural spine. The truncate elytra and round thorax sufficiently mark this species.

Harpalus laticeps, Lec. Length ·55 (·52–60). Black above and below,

shining, very broad and convex, legs and antennæ rufo-piceous. Head very broad, black, shining, smooth, the frontal impressions small, antennæ short, not reaching the base of thorax, dark testaceous; thorax one-half broader than long, sides distinctly depressed at and behind the middle, basal foveæ broad, not very deep, finely punctured, sides well rounded before, distinctly narrowed behind, basal angles obtuse and rounded at the extreme apex, the fine raised border is distinct at the side and base, the dorsal line distinct, abbreviated in front; elytra a little wider than the thorax, not deeply striate, impunctured, interstices flat, a dorsal puncture behind the middle near the second stria, N. H., Me., Vt. The large head and convex and obese form, well mark this beetle. In the ♀ the elytra are slightly opaque or silky *(sericeo-opaca)* and generally with a small sutural spine. In nearly all of my specimens the sides of the thorax for a short space behind the middle are very slightly sinuate, the terminal spur of the anterior tibiæ is quite long and broad.

Harpalus rufimanus, Lec., ·40–48. Black, shining; tibiae, tarsi and antennae rufo-piceous. Head smooth, not as broad as in the preceding, antennae quite short; thorax distinctly wider than head, one-half wider than long, sides slightly depressed behind, broadly rounded and distinctly narrowed posteriorly, basal foveae deep, somewhat linear, finely and confluently punctured, basal angles obtuse, scarcely rounded and sparsely punctured; elytra wider than thorax, ♀ "sericeo-opaca," striae deeper than in the preceding, impunctured, a small but distinct sutural spine in the ♀, behind the middle two dorsal punctures on the third interstices, near the second stria. The two punctures near together behind the middle on each elytron mark this beetle from all the other species, and perhaps I may say from all *Harpalidæ*. I cannot understand why this peculiarity has not been noted; Dr. LeConte neither mentions it in his description of the species (Ann. Lyc Nat. Hist. 4,402), or in his notes "On the species of *Harpalus* inhabiting America, north of Mexico" (Pro. Acad. Nat. Sci., Philadelphia, page 98, 1865). I have in my collection 3 ♂, 2 ♀ thus marked, one of which Dr. Horn, of Philadelphia, and Mr. Ulke, of D. C., identified as *H. rufimanus*, Lec. I have seen two specimens in another collection thus marked, and I have also seen in Dr. Harris' collection, a specimen sent him by Dr. LeConte, from Lake Superior, and by me sent back to Dr. LeConte last year, for the Boston Society Nat. Hist., to be identified; now with eight specimens before me, one from Lake Superior, the others from N. H. near the White Mountains, all that I have ever seen agreeing perfectly with all descriptions (save this peculiarity), and these particular specimens identified by Dr. LeConte, Dr. G. H. Horn and Mr. Henry Ulke, three of our greatest American Entomologists, I can see no reason for believing this an accidental marking

"Antennæ pale ferruginous, with a slight pubescence. Head and thorax ferruginous. Abdomen cinereous above, darker from numerous black scales below; anal tuft ferruginous. Tarsi annulated.

"Alar expansion 1.15 inch. Length of body 0.50 inch.

"*Habitat*, Nova Scotia. (No. 281, J. M. Jones). This very pretty little moth may be readily distinguished by its color and the conspicuous peculiarly shaped orbicular spot.

"Halifax: rare, taken in July at Ashbourne.—J. M. J."

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 54.)

STAPHYLINIDÆ.

FALAGRIA, *Mann.*
Dissecta, *Er.*
*Venustula, *Er.*
LEUCOPARYPHUS, *Kraats.*
*Silphoides, *Kr.*
COPROPORUS, *Kr.*
Ventriculus, *Kr.*
TACHINUS, *Grav.*
*Flavipennis, *Dej.*
*Memnonius, *Grav.*
Fumipennis, *Er.*
Picipes, *Er.*
Fimbriatus, *Grav.*
Limbatus, *Mels.*
TACYPORUS, *Grav.*
Jocosus, *Say,*
CONOSOMA, *Kr.*
Crassum, *Lec.*
Basale, *Lec.*
BOLETOBIUS, *Leach.*
*Niger, *Er.*
*Cincticollis, *Er.*
Cinctus, *Er.*
*Rostratus, *Lec.*
*Longiceps, *Lec.*
QUEDIUS, *Steph.*
Fulgidus, *Er.*
*Lævigatus, *Er.*
*Capucinus, *Er.*
Molochinus, *Er.*
CREOPHILUS, *Steph.*
Villosus, *Kirby.*
LEISTOTROPHUS, *Perty.*
Cingulatus, *Kr.*
OCYPUS, *Kirby.*
Ater, *Er.*
STAPHYLINUS, *Linn.*
Maculosus, *Grav.*
*Mysticus, *Er.*
Vulpinus, *Nord.*
Fossator, *Grav.*
STAPHYLINUS *(contin'd).*
Badipes, *Lec.*
Cinnamopterus, *Grav.*
Violaceus, *Grav.*
Capitatus, *Bland.*
PHILONTHUS, *Curtis.*
Cyanipennis, *Er.*
Aeneus, *Nord.*
Blandus, *Er.*
Promptus, *Er.*
Debilis, *Er.*
Lomatus, *Er.*
*Fulvipes, *Nord.*
*Aterrimus, *Er.*
Apicalis, *Er.*
XANTHOLINUS, *Serv.*
Fulgidus, *Er.*
Cephalus, *Say.*
Hamatus, *Say.*
BAPTOLINUS, *Kr.*
*Filicornis, *Payk.*
LATHROBIUM, *Grav.*
Grande, *Lec.*
Punctulatum, *Lec.*
Angulare, *Lec.*
Concolor, *Lec.*
*Armatum, *Say.*
*Longiusculus, *Grav.*
*Collare, *Er.*
CRYPTOBIUM, *Mann.*
Bicolor, *Er.*
Pallipes, *Nord.*
*Latebricola, *Nord.*
STILICUS, *Latr.*
*Angularis, *Er.*
*Dentatus, *Er.*
LITHOCHARIS, *Er.*
Confluens, *Er.*
SUNIUS, *Steph.*
*Prolixus, *Er.*
*Linearis, *Er.*
SUNIUS *(continued).*
Longiusculus, *Er.*

PÆDERUS, *Grav.*
Littorarius, *Grav.*
STENUS, *Latr.*
*Colon, *Say.*
Juno, *Fab.*
OXYPORUS, *Fab.*
Rufipennis, *Lec.*
*Femoralis, *Grav.*
Lateralis, *Grav.*
BLEDIUS, *Steph.*
Fumatus, *Lec.*
PLATYSTETHUS, *Mann.*
Americanus, *Er.*

OXYTELUS, *Grav.*
Sculptus, *Grav.*
TROGOPHLŒUS, *Mann.*
*Morio, *Er.*
ANTHOPHAGUS, *Grav.*
*Cæsus, *Er.*
LESTEVA, *Latr.*
*Biguttula, *Lec.*
ACIDOTA, *Steph.*
*Subcarinata, *Er.*
*Patruelis, *Lec.*
OLOPHRUM, *Er.*
*Emarginatum, *Er.*

TRIGONODEMUS, *Lec.*
Striatus, *Lec.*
ANTHOBIUM, *Steph.*
Protectum, *Lec.*
PROTEINUS, *Latr.*
Parvulus, *Lec.*
MEGARTHRUS, *Steph.*
*Americanus, *Sachse.*
Angulicollis, *Makl.*
ŌLISTHÆRUS, *Er.*
Nitidus, *Lec.*
GLYPTOMA, *Er.*
*Costale, *Er.*

HISTERIDÆ.

HOLOLEPTA, *Payk.*
Fossularis, *Say.*
HISTER, *Linn.*
Interruptus, *Beauv.*
Merdarius, *Payk.*
*Harrisii, *Kirby.*
Fœdatus, *Lec.*
*Cognatus, *Lec.*
Marginicollis, *Lec.*
Dēpurator, *Say.*
Abbreviatus, *Fab.*
*Sedecim striatus, *Say.*
Americanus, *Payk.*
*Carolinus, *Payk.*
LeContei, *Mars.*
Parallelus, *Say.*

Coarctatus, *Lec.*
*Cylindricus, *Payk.*
Gracilis, *Lec.*
PHELISTER, *Mars.*
*Subrotundus, *Mars.*
TRIBALUS, *Er.*
*Americanus, *Lec.*
PAROMALUS, *Er.*
——— ?
SAPRINUS, *Leach.*
Distinguendus, *Mars.*
*Pensylvanicus, *Er.*
Conformis, *Lec.*
Assimilis, *Er.*
*Scrupularis, *Lec.*
Fraternus, *Lec.*

*Deletus, *Lec.*
TERETRIUS, *Er.*
*Americanus, *Lec.*
PLEGADERUS, *Er.*
Transversus, *Say.*
ACRITUS, *Lec.*
*Exiguus, *Lec.*

SCAPHIDIIDÆ.

SCAPHIDIUM, *Oliv.*
4 Pustulatum, *Say.*
Piceum. *Mels.*
SCAPHISOMA, *Leach.*
Convexum, *Say.*
TOXIDIUM, *Lec.*
Gammaroides, *Lec.*

MISCELLANEOUS NOTES.

LARVA OF HELIOTHIS ARMIGERA.—At a recent meeting of the Entomological Society of London, Eng., "Mr. J. Jenner Weir exhibited two specimens of *Heliothis armigera*, Linn. (*H. umbrosus*, Grote), bred from larvæ which fed in tomatoes. An importation of tomatoes from Spain or Portugal had been greatly damaged by a number of green larvæ, with black lines and spots, which fed in the fruit, where there was apparently juice enough to drown them, and which ultimately produced the moths exhibited." This

* Species marked with an asterisk have not been before included in the list of *Canadian Coleoptera*.

insect has been taken in all parts of the world, and of late years in the United States. In Illinois and Kentucky the larva has been very destructive to Indian Corn, and in the former State to the tomato as well (*Amer. Ent.*, i. 212). Mr. Glover has found it feeding in a young pumpkin; but it is best known in the United States as the Cotton Boll-worm, from the injury it inflicts upon the cotton crop. It is probable also that it attacks Indian Corn in Canada, (*Vide C. Farmer*, 1869, p. 425).

CAPTURES AT NORTH DOURO.—An attack of ague—for although that depressing complaint is happily of infrequent occurrence in our village, it was exceedingly prevalent last year—and a subsequent lengthened absence from home for the recuperation of health, prevented me from devoting much time, last summer, to the capture of entomological specimens for my cabinet.

Perhaps the most interesting addition I made to my collection was a very good specimen of the *Thyreus nessus*.

The *Colias philodice* appeared in great abundance, noticed chiefly around the puddles on the roads.

Among the *Coleoptera* captured was the "one-coloured *Prionus*," *Prionus unicolor*, called now, I believe, *Orthosoma cylindricum*. It is a good specimen, measuring 1½ in., exceeding by ¼ in. another specimen previously included in my collection.

Some of the "Buprestians," particularly the *Buprestis Virginica*, we find constantly in our neighbourhood. Last year I captured the *Buprestis fulvoguttata*, the "tawny-spotted Buprestis;" it measures a little over ⅞ in.

The large "Capricorn beetles," *Monohammus titillator*, were unusually abundant last season. I captured numerous specimens for the purpose of measuring their *antennæ*, one pair of which had attained to the unusual—as far as my experience extends—length of 3⅛ in.

I also added a "Tree-hopper," *Cicada canicularis*, to my collection. Both my specimens are of the same length, a little over 1⅛ in. to the end of the wing covers.

My Dahlias, last year, were infested with *hemiptera*. Indisposition at the time of their appearance disinclined me from the trouble of endeavouring to ascertain even the group to which they belonged. They were about ⅜ in in length, and prettily coloured.

Around my currant bushes were playing, during the summer months, innumerable "Ichneumon flies." I never saw so many congregated within a similar space before. They were of different sizes and colours. I noticed one of the larger ones, of a steel-blue colour, with a linear body, entangled in a spider's web. Madame Arachne, however, soon discovered that she had "caught a Tartar;" for, after a few ineffectual struggles to escape, the

Ichneumon managed to insert her ovipositor into the body of the spider, retaining it there for a longer period than would have sufficed for the deposit of an egg—probably the original intention—in fact, until the spider was, or appeared to be, dead. I need scarcely add, that I always welcome the appearance of the ichneumons, cruel as is their mode of propagation.

I saw a *Tremex columba* on one of the window-sills of my church. It was beyond my reach, and, having specimens in my cabinet, I took no pains to secure it.

And, to conclude this gossiping communication, I found, on a spruce tree, two *larvæ* of the *Orgyia leucostigma*.—V. CLEMENTI, North Douro, Ont.

RASPBERRY GALL.—Towards the end of the summer of 1868, while entomologizing in the neighborhood of Billing's Bridge, south of Ottawa, in company with Mr. B. Billings, I noticed that the roots of the common raspberry, growing in certain localities, were attacked by a species of gall-fly. I recognized this gall as similar to one which I found on the 31st May, at a place called La Table Bay, Labrador. The galls are generally attached to the roots, but they sometimes occur on that portion of the stem which is covered with earth. I collected a quantity of the Labrador galls, which were placed in a paper bag, and brought to Quebec, where the *(Hymenopterous)* insects emerged, but unfortunately the galls and insects were lost on my removal to this city. The galls are small, spherical, and sometimes found in clusters, each being a cell, containing one insect. I visited the locality near this city this spring, but found the place covered with water, and I have not had another opportunity to look after them. I believe it was not described up to 1868. Do any of your correspondents know it?—WILLIAM COUPER, Ottawa, Ontario.

AN ODD PLACE FOR A HUMBLE BEE'S NEST.—Our country butcher being for a long time annoyed in his shop with humble bees, was at a loss to find out where they all came from. His shop is a wooden erection, having a broad running beam at the top of the wall to support the roof. The windows are open in the summer and the apertures covered with hexagon wire netting. On carefully searching the premises, he discovered on the top of this beam, at the foot of a rafter, a thriving colony of humble bees, snugly ensconced among the wool in a *sheep's tail* which he had cut off and thrown there some time in the spring. At my request the butcher promised to preserve it, but unfortunately, when I next went to see it, I learned that some rats had found it out and destroyed it.—R. D. CRUDEN, in *Science Gossip*. [Last summer I observed a somewhat similar instance. In the spring I carelessly threw a buffalo skin over a beam in my barn, in such a way that the sides hung down with the hairy portions inwards. Sometime

afterwards, suspecting the depredations of moths, I proceeded to beat the skin with a stick, and was considerably astonished to hear a great buzzing, and find myself attacked by some enraged humble bees, who had made their nest among the hair. After a time the skin was knocked down upon the floor, and the bees deserted their novel quarters.—C. J. S. B.]

ENTOMOLOGICAL SOCIETY OF CANADA.

At a recent Meeting of the Council of the Agricultural and Arts Association of Ontario, the following resolution was adopted ,—

"That the Secretary notify the Entomological Society that their Report will not be required until about the 1st of October; also that the grant will be paid at the same time as the County Societies; also that they will be furnished with room for their Cabinet in the Agricultural Hall."

At an informal meeting of some members of the Council of the Entomological Society, who met in London, on the 15th ult., it was resolved that the Report for 1870 should comprise a description of the insects noxious and beneficial to the following productions of the field, the garden and the orchard: wheat, potatoes, peas, hops: the apple, plum, grape, currant and gooseberry; the strawberry, cabbage, cucumber and squash, and any other crop, fruit, or vegetable that may be attacked during the coming season by a new ravager or in a more than ordinary degree. Members of the Society, and the public generally, are requested to kindly render such assistance as may be in their power, by forwarding specimens and furnishing information of insect depredations, to either the general Secretary, Rev. C. J. S. Bethune, Credit, Ont., or to the Secretary of the London Branch, E. B. Reed, Esq., London, Ont.

Specimens of noxious and beneficial insects in all their stages, and examples of their work and operation, are earnestly requested for the Cabinet of the Society. They may be sent by mail, with perfect safety, if enclosed in stiff pasteboard, or tin boxes of convenient size, and packed with a little cotton-batting, wool, or other soft substance. They should never be enclosed in a letter without some such protection, nor should dead specimens be sent loose in a box. Living larvæ should be sent in *air-tight boxes*, with sufficient food to last them on their journey; otherwise they die on the road and shrivel so much as to become unrecognizable. Dead larvæ should be carefully packed in small vials filled with diluted spirits. As much information as can be afforded about the specimens is always most desirable.

REPORT OF THE LONDON BRANCH,

FOR THE YEAR ENDING DECEMBER 31, 1869.

Your Committee present the Fifth Annual Report. We congratulate the members on the prosperous state of the London Branch. The Financial Statement shows a small

balance in hand, after paying off some $45 of the debt on the Society's Apparatus, and we trust that during the present year this debt will be greatly reduced. The Society numbers 30, and we hope to procure some fresh additions to our ranks. We feel that the Society is greatly indebted to those of our members, who, not being practical entomologists themselves, yet aid and encourage us by their subscriptions in prosecuting our useful work. The last Provincial Exhibition bore good testimony to the industry and perseverance of London Collectors. The display of Insects there was probably the finest ever yet exhibited in the Dominion. We feel proud in recording that Four Prizes were obtained, amounting to $26 50. This sum, in accordance with our usual custom, was added to the funds of the Branch. We must not omit to notice that Entomology has been started at the Hellmuth College, and the Head Master, the Rev. A. Sweatman, is desirous of giving the science every encouragement.

It is with pleasure that we now record the success of the Parent Society in obtaining aid from government. Upon a strong application to the Agricultural Association of Ontario, the Board has made a grant of $400 for the present year, conditional on a Report being made and collections procured, and the publication of the CANADIAN ENTOMOLOGIST being continued. This is, indeed, a great success, and we trust that through this wise liberality the Society may be enabled to diffuse, far and wide, a more practical knowledge of Entomology. The CANADIAN ENTOMOLOGIST has entered on its second year, and bids fair to obtain a good share of success. We notice that its pages are now doubled. We earnestly request our members to contribute to its pages any interesting facts in Entomology that may come under their notice.

We also beg to inform the members that the Parent Society, in acknowledgment of the industry and importance of the London Branch, has donated $75 for the purchase of a Cabinet for the Branch; any contributions of Insects will therefore be most welcome.

In conclusion, we trust that the members will use their best endeavors to promote the interests of the Society, remembering that our aim is not a selfish one, but that the practical results of our labor affect the interests of a very large proportion of our community.

EDMUND BAYNES REED,
Sec. and Treasurer.

GEORGE M. INNES,
President London Branch.

BOOKS RECEIVED.

Nature.—A weekly illustrated Journal of Science. Macmillan & Co., London. Nos. 9-15. The objects of this excellent new publication are, as stated in its prospectus, "to place before the general public the grand results of scientific work and scientific discovery, and to urge the claims of science to a more general recognition in education and in daily life; and to aid scientific men themselves, by giving early information of all advances made in any branch of natural knowledge throughout the world, and by affording them an opportunity of discussing the various scientific questions which arise from time to time." The numbers before us bear ample witness to the satisfactory mode in which these objects are being carried out; they contain a large number of practically cientific articles by eminent writers, accounts of recent scientific discoveries, valuable re-

views of new works in all departments of science, reports of meetings, and abstracts of important papers read before learned societies in all parts of the world, much interesting correspondence and notes of a general character. A regular perusal of this publication cannot fail to be of great benefit to any naturalist or scientific student. No. 14 contains some copious extracts from what appears to have been a very able and interesting address delivered to the Entomological Society of London by the President, Mr. W. H. Bates. No. 15, an article on "Entomology in America," referring especially to Dr. Packard's *Guide to the Study of Insects.*

Hardwicke's Science Gossip—Nos. 61 and 62, January and February, 1870—Contains many entomological articles and notes, as well as much that is interesting in other departments of science.

Le Naturaliste Canadien, Vol. ii., Nos. 2 and 3; January and February, 1870. The former number contains a continuation of the list of *Coleoptera* taken at Portneuf, P. Q., which it is intercsting to compare with Mr. Pettit's of Grimsby, Ont. The latter number includes an article on "Agriculture and Entomology," being a petition presented by the Editor to the Council of Agriculture at Quebec, drawing their attention to the ravages of insects, and calling upon them to render assistance to the work of investigating their natural history.

The Canadian Naturalist and Quarterly Journal of Science. Montreal: Dawson Brothers. Vol. ii. Nos. 2 and 3. Sept. 1869. Contains "Notes on the Small Cabbage Butterfly, *Pieris rapæ*," by Mr Ritchie, and a review of Harris' *Entomological Correspondence*, in our department of natural history.

The Canadian Builder and Mechanic's Magaziae. Dyas & Wilkens, London, Ont.-Jan. 1870. An illustrated monthly publication, edited by practical men, who are engaged in these departments of industry.

A Preliminary List of the Butterflies of Iowa. By S. H. Scudder (From the Transactions of the Chicago Academy of Sciences). Embraces 46 species, including the following new species: *Chrysophanus Dione*, *Apatura Proserpina*, *Nisoniades martialis*, and *Hesperia Iowa.*

Proceedings of the Boston Society of Natural History. Vol. xiii., pages 161 to 192. ——*The American Entomologist.* Vol. ii., Nos. 3 & 4.——*The American Naturalist.* Vol. iii, No. 11.——*The American Agriculturist*——*The Canada Farmer.*——*The Maine Farmer.*——*New York Sun.*——*Once a Month, Arthur's Home Magazine*, and *The Children's Hour.* — *Newman's Entomologist.* Nos. 73 and 74 (from Mr. Reeks). ——*The Rural New Yorker.*——*Report of the Fruit Grower's Association for 1869.*—— *The Gavel.* No. 2. Toronto, February, 1860. A new Masonic Magazine, edited by Dr. R. Ramsay.

Proceedings and Transactions of the Nova Scotian Institute of Natural Science of Halifax, N. S.—Vol. ii., part 3, 1868-9. It is pleasing to find such tokens of prosperity and success manifested by a scientific society as are apparent in the handsomely printed volume before us. It contains, besides the proceedings of the Institute, thirteen

papers read at its meetings by members engaged in different branches of science. In Entomology there is a paper on Nova Scotian Lepidoptera by the Rev. C. J. S. Bethune and Mr. J. M. Jones, and a preliminary synonymic List of Coleoptera of the same Province, by the latter gentleman. The Part is illustrated by 5 plates and diagrams, including a lithographic drawing by Mr. Jones, of *Anarta Acadiensis*, Bethune.

ADVERTISEMENTS.

FOR SALE CHEAP.—A fine Oxy-Hydrogen Dissolving-View Apparatus, with Polariscope, Microscope, and Kaleidoscope complete; and a large collection of suitable slides. Apply to E. B. REED, London, Ont.

PETITES NOUVELLES ENTOMOLOGIQUES.—On the 1st and 15th of each month.—This periodical contains a resume of all news concerning entomologists and their doings, and is indispensable to all who wish to keep themselves posted up in current entomological information. Subscription (for Canada) $1.20 a year, post free. All communications to be addressed to Mons. E Deyrolle, fils, 19 Rue de la Monnaie, Paris, France. Canadian subscribers can remit in two or three cent postage stamps.

N. B.—We shall be prepared in a few weeks to supply subscribers in Canada and the United States with the above publication at the price named, $1.20 a year, post free. Applications may be sent at once.—ED. C. E.

CLUB RATES.—In addition to the Club rates announced on the second page of the wrapper, we are enabled to offer the following:

The American Agriculturist ($1.50), and the *Canadian Entomologist* ($1), for $2.

Once a Month ($2), and the *Canadian Entomologist* ($1) for $2.25.

Arthur's Home Magazine ($2), and the *Canadian Entomologist* ($1) for $2.25.

The *Children's Hour* ($1.25), and the *Canadian Entomologist* ($1), for $1.75.

The *Educator* (36 cents), and the *Canadian Entomologist* ($1), for $1.05.

Petites Nouvelles Entomologiques ($1.20), and the *Canadian Entomologist* ($1) for $2.

AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper; Naturalist, Ottawa, Ont; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.. R. Trestrail & Son, The Bazaar, Dixon, Ill.

FRANCE.—E. Deyrolle, fils, 19 Rue de la Monnaie, Paris.

ENGLAND.—We hope to be able to announce the name of an agent in London in our next issue.

*** We regret that this number should have been delayed by unavoidable circumstances, beyond the time announced for its issue. April 1st is the date set down for the issue of No. 6; communications for insertion should be in our hands at least ten days previously.

Harpalus spadiceus, Dej. Length ·33–38. Rufo-piceous, legs and antennae ferruginous. Head smooth, rather large, mandibles long; thorax one-half wider than head, a little wider than long, sides broadly rounded, not at all depressed, strongly narrowed behind, basal angles obtuse, not rounded, basal foveae narrow, shallow, more or less punctured, disk smooth, somewhat convex; elytra oval, widest a little behind the middle, striae deep, impunctured, interstices convex with a dorsal puncture on the third near the second stria, behind the middle, elytra not opaque or reticulate in either sex. This beetle resembles *H. herbivagus* in color and size, but is more robust (convex), and in this respect more like *H. fallax*, Lec., and *H. Pleuriticus*, Kirby, but differs from both by the larger head and mandibles, and the strongly narrowed thorax posteriorly; it resembles in form of thorax, *H. viridiaeneus*, but is still more strongly narrowed behind. Not common in New England; two examples from Massachusetts.

The above descriptions comprise most of our species whose form is so well marked as to be most readily recognized, and not easily confounded with others.

The reader is requested to make the following correction in my first paper:—Page 46, line 15 from top, after "*this paper*" insert "(4);" and at line 22, for "*having*" read "*the latter, however, has.*"

ON THE LARVA OF *THECLA INORATA*, G. & R.

BY W. SAUNDERS, LONDON, ONT.

On the 15th of June, 1869, I obtained several *Thecla* larvae by beating over an umbrella the branches of some small oak trees growing in a cemetery about two miles west of London. Not having met with them before I at once took the following description:

Length, ·40 in., onisciform. Head small, pale greenish-yellow, with a minute black dot on each side. Mandibles pale brown, with a faint whitish patch immediately above them.

Body above *yellowish-green, streaked above with yellowish-white*, and thickly covered with fine, short, white hairs; second segment of rather a darker shade of green than the rest of the body. *A dark green dorsal stripe, on 3rd, 4th and 5th segments, the full width of the dorsal crest; narrow on the four terminal segments, almost obsolete on those intermediate.* A faint whitish dorsal line runs through the centre of this stripe. Dorsal crest edged with yellowish-white, most apparent where it borders the darker portions of dorsal stripe; sides of body with a few faint oblique lines of yellowish-white; body margined on each side with the same color close to

under surface extending around the posterior segments. In some younger specimens these yellowish-white markings have a reddish or brownish tint.

Under surface deeper bluish-green, with a faint white bloom. Feet and prolegs partake of the general color.

June 21st.—Since the 15th most of the larvæ have moulted, resulting in some change in their appearance.

Length ·55 in. Head, color and markings as before.

Body above dull white with a faint green tinge, changing in some specimens to a slight ochrey-reddish tinge, thickly covered with minute white hairs; second segment pale green. The green dorsal stripe on third, fourth, and fifth segments has acquired a deep greenish brown tint, which contrasts strongly with the general color of body; the same change is also observable on the last four segments, and here the stripe is much widened, the anterior portion of it assuming the form of a triangular patch, its base on posterior part of eleventh segment, its apex on anterior part of tenth; on the intermediate segments the dorsal stripe is obsolete. On the fifth segment a streak of dark brown crosses the end of the dark dorsal stripe extending about half way down the sides; there is also a dot of the same color on each side of this segment close to under surface. On the sides of the fourth and sixth segments are several additional brown dots, very small. The tenth and eleventh segments have an oblique brown streak on each side, with a small spot of the same color placed below it. The sides of body have five or six white oblique lines.

Under surface green, with a whitish bloom; a patch of brown on each side in continuation of spots on tenth and eleventh segments; a patch of the same also behind the last pair of prolegs.

Before entering the pupa state these larvæ assumed a delicate pink color, the dorsal stripe becoming darker, the other lines paler. Length .60 in. Head, color and markings as before. Body above dull whitish pink; second segment greenish; dorsal stripe on third, fourth and fifth segments very dark brown, widest on fifth, where there is a spot of the same color on each side of it. The lines bordering dorsal crest, oblique lines on sides, and edging of under surface, all pale pink. On the hinder segments the anterior portion of dorsal stripe is widened, assuming the form of a triangular patch as before, its color scarcely so dark as that on anterior segments.

Under surface green with a yellowish tint, feet and prolegs of the same shade.

One of these became a chrysalis on the 27th of June. Length of pupa, ·40 in. Color pale brown, sprinkled with many dots of a darker shade, and thickly covered with short yellow hairs. A ventral line of dark brown

along posterior segments. Under surface much paler. This description was taken June 30th. The imago appeared on the 13th July.

Among the first lot of larvæ secured one differed materially from the others in its appearance just before entering the chrysalis state. The body assumed a *deep green color* with the same dark brown dorsal markings, while the yellow edging of dorsal crest appeared very prominent in consequence of the deepening of general color, on posterior segments it was indistinct. The bordering around body close to under surface was dull pink, and the oblique lines on sides of body scarcely perceptible. The under surface was a little deeper in color than upper ; feet faintly tipped with brown.

This specimen became a pupa June 24th, and the following description was taken on the 28th. Length, .40 in. Color, *brownish black*, thickly covered with short yellowish hairs, with three or four faint brown spots on each side of the ventral line on posterior segments. Wing cases mottled with pale brown, under surface paler. This produced the imago July 10th.

On the first of July some additional specimens of the larva were taken by Mr. E. B. Reed in another locality, also on oak. Several of these were kindly placed at my disposal. Some were of the normal cast as first described, while two or three appeared very distinct. The head had the same color and markings in all ; but in one case the *body was pale brown* with a pinkish tinge, thickly covered with short whitish hairs ; *no yellow or other markings*. Under surface yellowish-green. In a second specimen the color was of the same pale brown shade, but the yellow markings were present. Both these examples presented a marked contrast with the common form of whitish or greenish-white larva with broken dorsal stripe.

In all these cases the imago appeared identical—after a careful examination I could not detect any difference worthy of notice. Two of the common form of larvæ produced each three dipterous parasites, which escaped from the larva when full grown, and produced pupæ .19 in. in length, nearly oval in form; color dark brownish-red. One of these produced the imago on the 11th of July. The insect has not yet been determined.

In this interesting series of specimens we have the same imago produced from

First—A dull *white* or *whitish-green* larva, with *green* dorsal stripe and whitish lines, producing a *pale-brown* chrysalis.

Second—A *deep green* larva with *dark brown* dorsal stripe and *yellow* lines, producing a brownish-black chrysalis.

Third—A *pale brown* larva with a pinkish tinge, *with no dorsal stripe or other markings.*

Fourth—A pale brown larva with yellow lines.

Thus showing variations as wide as those marking some distinct species.

The figure of this larva given in Boisduval and Leconte (Pl. 29, fig. 4), although very imperfect, is evidently intended to represent the normal form of this larva. It is there stated to feed on different species of thorn (*Cratægus* ——).

A NEW SPECIES OF *ANARTA* FROM NOVA SCOTIA.

BY THE EDITOR.

In the Proceedings and Transactions of the Nova Scotian Institute of Natural Science (1868-9, p. 78–87), I have given a list of some specimens of Nova Scotian Lepidoptera, sent me for determination by the esteemed President of the Institute, J. Matthew Jones, Esq., of Halifax. Among these was included a new species of *Anarta*, the description of which I reprint here, as many of those interested in this department of Entomology may not have access to the original publication.

"*Anarta Acadiensis*, Bethune (Pro. Trans. N. S. Inst. Nat. Sci., 1868-9, p. 84). The pretty little species of this genus are chiefly confined to mountainous and sub-arctic regions; one, however, is taken all over England, and another, *A. luteola*, Grote & Rob., has been found in the neighborhood of Quebec; Dr. Packard (Pro. Boston Soc. Nat. Hist. Oct. 17, 1866), has described several species taken in Labrador. The following is a description of our species:—

"Anterior wings dull brick red, sparsely powdered with black scales. Basal line indistinct, doubled, slightly dentate, black; transverse anterior line black, perpendicular to costa for nearly half its length, than curved outwards forming an irregular arc to the inner margin. Median space darker, with a transverse central black shade; orbicular spot very conspicuous, creamy white, with a few scattered ferruginous scales in the middle, narrowed posteriorly and produced till it meets the edge of the reniform; this spot is of the normal shape, concolorous with the rest of the wing, conspicuously bordered with white, except inferiorly where it is open and encroached upon by the dark central shade. Transverse posterior line, black, fine, forming a very convex arc outside of the reniform spot. Subterminal and terminal spaces paler; subterminal line rather broad, distinct, black, arising from a triangular black spot on the costa, slightly wavy, parallel to the outer margin; terminal line deep black, very distinct; fringes concolorous with the wing.

"Posterior wings shining, straw-yellow, with a broad well-defined black border, which is slightly excavated interiorly just before the anal angle; costa, base and inner margin broadly discolored with black scales; fringes golden yellow at apex, pale yellow inferiorly.

"Under side of anterior wings shining, the costa narrowly, and the outer margi broadly, reddish-yellow, especially at the apex; inner margin rather broadly pale yellow all the rest uniformly deep black. Posterior wings shining, pale yellow, with the cos and apex broadly irrorate with bright ferruginous scales, and a narrow ill-defined su marginal band; fringes pale yellow.

The Canadian Entomologist.

VOL. II. TORONTO, APRIL 8, 1870. No. 6.

NOTE ON *AMPHIPYRA TRAGOPOGONIS*, LINN.

BY THE EDITOR.

On the 6th of June, 1868, we observed for the first time a handsome green caterpillar eating some lettuce that we were growing in our grapery; thinking that it could not very well escape we merely took a rough description, as follows: Sixteen footed caterpillar, about an inch long, pale green (almost the color of lettuce leaves) above, deeper green below; a white dorsal line, two lateral white lines, the lower passing through the spiracles; all five lines proceeding from head to tail. Before we secured it, it did however escape, probably entering the ground.

The following year, in June and early in July, we observed many similar larvæ on a number of different plants, both in the garden and in the woods. The following description of a nearly full-grown specimen was taken on the 3rd of July:—

Length 1.00 inch. Colour beautiful apple-green. Head pale green, with a dark spot on each side in front; dorsal, sub-dorsal, and spiracular lines, narrow, pure white; the spiracular lines begin on the second segment, the others on the third; on all the segments except the head and second, there are a few minute white granulations tipped with black, and terminating each in a fine hair; spiracles white; feet green.

On July 11th it formed a slight silken cocoon in the box in which it was confined, having no earth to burrow into, and there assumed the pupa state. The imago appeared on the 3rd of August, and proved to be a specimen of *Amphipyra tragopogonis*, Linn.

This excessively common moth, found all over the Province of Ontario, and also in Quebec, appears to be an importation from Europe, where, according to Guénée and Stainton, it is very abundant. Its specific name is derived from the Salsify, or Vegetable-oyster plant (*Tragopogon*), on which, as well as on Spinach, Dock, and other plants, it feeds, according to Fabricius. In England it is called the "Mouse" moth, either from its colour or its habit "of creeping into houses, and secreting itself in blinds, and

when dislodged, if it falls on its back or belly, of shuffling along in a ver peculiar manner" (Stainton). In this country we often find it about vene tian shutters in the summer time, and through the winter its remains ar very abundant in cobwebs about the windows of little-used buildings,— as, for instance, in the Cemetery Chapel at Cobourg a few years ago.

The imago may be at once recognized by the three black dots,—one o the disk, and two occupying the place of the reniform spot,—on the du greyish-brown fore-wings; the hind-wings are much paler, shaded e teriorly, and immaculate; the abdomen is flattened; and the whole inse has a satiny lustre in certain lights.

There is another equally abundant species of this genus, the Coppe Underwing (*A pyramidoides*, Guén.) which can usually be taken in grea numbers in August and September. Its larva is stated (*Amer. Ent.* ii. 2 to feed on the leaves of the Grape, Poplar, and Red-bud (*Cercis canadensis* and by Guénée, on Oaks (*Quercus*). Grote (*Pro. Ent. Soc. Phil.* iii. 8 describes, under the name of *A. inornata*, another species from Canad taken by Mr. Saunders, but we have never met with it, and are inclined t think from his description that it is merely a variety of the foregoing.

ON THE LARVÆ OF SOME LEPIDOPTERA.

BY W. SAUNDERS.

ARCTIA CELIA, *Saunders.*

A single full grown specimen of the larva of this species was found unde a log in a wood near London on the 11th of June. Length one inch Head black and shining.

Body above *brownish black*, closely covered with tufts of moderatel long, stiff hairs, proceeding from elevated shining tubercles. Hairs an tubercles a little darker than the surface of body *excepting along the side where, although the tubercles continue the same, the hairs are changed to yellowish-brown color.*

Under surface brown, with a slight greenish tint; fifth, sixth, eleventh and twelfth segments are each belted with a series of tufts of short yellow ish-brown hairs, in continuation of those above. Feet black and shining Prolegs yellowish-brown and hairy.

This larva changed to a chrysalis on the 13th of June, and produce the imago on the 30th of the same month.

CIDARIA DIVERSILINEATA, *Hubn.*

The date of the capture of these larvæ I failed to record. It was earl in summer, and they were very abundant on the leaves of the America Ivy (*Ampelopsis quinquefolia*), on which they fed.

Length from one to one and a quarter inches. Head flat, with two prominent black points or processes above, mandibles yellowish-white.

Body above dark dull brown, with a slightly reddish tint, and patches of a darker shade along the dorsal region. On each side close to under surface is a longitudinal ridge.

Under surface similar in color to upper, excepting the spaces between the feet and the two pairs of prolegs, which are of a greenish color. Feet crowded closely together, of a brownish-black color, prolegs of a similar shade. The hinder pair tinged with green.

In some specimens the general color is lighter. When alarmed they straighten themselves out, and remain for some time in that position, and being so nearly of the hue of the twigs of the plant they feed on, they thus often escape detection.

MAMESTRA ARCTICA, *Encyc.*

In No. 3 of the present volume of the *Entomologist*, C. S. Minot, Esq., of Boston, published some interesting notes on the eggs of this species. Observations made last year enable me to add another fragment to the knowledge we have of the history of this—one of our commonest moths.

On the first of June two full grown specimens of the larvæ were found under turf—they probably fed on the roots of the grass, &c.

Length one and a quarter inches.

Head rather large, bilobed, reddish, with a polished surface ; mandibles black.

Body above dull greenish-white, smooth, shining, and somewhat semi-transparent, a little darker between segments. Second segment with a horny plate above similar in appearance to head, but of rather a darker hue. There are on each segment a few very small brownish dots, from each of which there arises a single fine brownish hair. Sides of body much wrinkled ; terminal segment small, brownish-black ; spiracles black.

Under surface similar to upper, feet brown, prolegs tipped with black. These changed to chrysalides about the 3rd of June, and produced the imago in the latter part of the same month.

In a previous year I found the same larva full grown as late as the 26th of June.

DRYOCAMPA RUBICUNDA, *Fab.*

Larva found feeding on silver maple July 30th.

Length one inch, cylindrical. Head rather small, flattened, in front bilobed, pale orange, with a black dot on each side below, near mandibles.

Body above yellowish-white, thickly covered with minute whitish granulations, only visible with a magnifying lens, with a dorsal and three lateral

stripes of pale green, rather indistinct. Second segment greenish-white with a row of six black dots or minute tubercles, but slightly raised on its anterior edge. *Third segment with two black horns nearly one-tenth of an inch long*, one on each side of the dorsal line and spreading outwards, and forward below these on each side are two small black tubercles. Each segment behind this to eleventh inclusive has a transverse row of six of these black points or tubercles, those close to under surface being largest, those above much smaller, the upper ones scarcely visible without a magnifying glass. On twelfth and thirteenth segments these tubercles are a little more prominent and about equal sized throughout, numbering six on twelfth and three on thirteenth segments. Anal lid pale green, with its outer edge fringed with eight small black tubercles, so small as to be scarcely visible. On sides of twelfth segment, close to under surface, and extending slightly into the segments on each side, is a pale reddish-orange patch or short stripe nearly the color of head.

Under surface glossy green, with a faint whitish line down the middle and many small blackish dots or tubercles, some of which are arranged in a longitudinal row outside feet and prolegs. Feet dark-brown, nearly black, shining; prolegs pale green.

On the 28th of August these larvæ were about full grown.

Length 1¾ inches. Head as before. Horns on third segment fully one-tenth of an inch long. Upper tubercles on middle and hinder segments quite distinct. Reddish patch on sides of posterior segments larger, extending over 11th, 12th and part of 13th segments, but less bright in color than head.

Under surface deeper green, feet pale reddish, prolegs pale green dotted with black.

These entered the ground shortly after and changed to chrysalides, producing the imago early the following summer.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

I—COLEOPTERA.

For ten years we have been trying, and trying in vain, both in England and America, to obtain a copy of Kirby's descriptions of the insects of the Northern parts of British America, contained in the fourth volume of Richardson's *Fauna Boreali-Americana*, published at Norwich in 1837. Many of our friends have been making similar attempts, and always with the like ill-success. We have had, however, occasional access to a copy in the library of the University of Toronto, which, with the exception of

12. BRACHINUS CYANNIPENNIS, *Say*.—[Say's Ent. Works, ii. 91.] Several specimens of this insect were taken in the journey from New York to Cumberland House, and in lat. 54°; it was also taken in Canada by Dr. Bigsby.

[17] 13. CARABUS VIETINGHOVII, *Adams*.—(Mem. Soc. Nat. Moscow, iii. 170; *Fischer* Ent. Russ. i. 98; *Dej.* Coleopt. ii. 61, 21.) Kirby, plate 1., fig. 3.

♀. Length of the body 10 lines. Body very black and glossy. Head punctured between the eyes with confluent but not minute punctures; anterior part of the front wrinkled on each side, but the nose and upper lip are quite smooth; the seven terminal joints of the antennæ are brown; the prothorax is nearly square with the sides rounded anteriorly and the posterior angles a little prominent; it is deeply channelled, transversely wrinkled in the disk, confluently but not minutely punctured on the sides; the disk also is black, but the sides exhibit shades of dark blue and green; at the margin they are of a most brilliant ruddy copper, some of the anterior punctures also appear as if gilded: the elytra are rough and as it were reticulated with longitudinal and transverse elevations, the former nearly arranged in lines which produce deep cavities; the disk is of a fine deep blue, the sides green and the lateral margin of the same ruddy copper as that of the prothorax. The body underneath is quite smooth in the disk, with some irregular elevations and depressions on the sides: the sides of the ante-pectus, or fore-breast, are of a fine green; the intermediate segments have each a pair of impressions from which a hair emerges. This is most visible in the ♂.

I at first regarded this splendid insect as a new species. I thought it, indeed, very near *C. Vietinghovii*, but as it did not altogether agree either with Dr. Fischer's figure or description, and was found in another quarter of the globe, I regarded it as distinct; but having received from my friend Mr. Hope, a Russian specimen of that insect, I find no difference sufficient to constitute a species. In that specimen the marginal gilding of the prothorax and elytra is greener with scarcely any of the ruddy hue of copper which gives such brilliance to the American specimen.

[A single specimen only of this magnificent beetle was brought to Mr. Kirby in the Richardson collection, and no locality is given of its capture; can it have come from Russia and not from British America? No specimen of it has been taken in this country, so far as we are aware, since the time of that expedition, a period of over 30 years. It might have been included in the collection by some accident,—a not infrequent occurrence. Prof. Croft, for instance, writes us that some years ago he had a collection of moths given to him "collected in or near Toronto," yet among them was

a gigantic Chinese Saturnia! He adds, that on looking into Fischer's work he finds the habitat for the insect is "Eastern Siberia—banks of the Lena."]

[18] 14. CARABUS LIGATUS, *Knoch.*—Taken in Canada by Dr. Bigsby. Length of body 7½ lines.

Body black and glossy. Head oblong, impunctured, separated from the neck by a transverse slender curving ridge forming anteriorly a deep sinus; ridge, defending the base of the antennæ, conspicuous; frontal impressions long, not deep; antennæ not much longer than the prothorax; prothorax nearly square, black slightly bronzed: sides lightly punctured, lateral margin reflexed; it is faintly channelled, depressed transversely at the base, with a punctured impression on each side; elytra bronzed, subdepressed with scarcely any sinus at the apex, lateral margin reflexed and carinated: each elytrum with 13 or 14 rows of impressed punctures; a triple series of oblong discoidal elevations; interstices with numerous transverse linear impressions: abdomen underneath smooth with a few minute punctures on the sides.

The insect here described agrees with Germar's description of Knoch's *C. ligatus*, but it is doubtful whether it be synonymous with *C. carinatus* of DeJean. In most respects, indeed, it accords precisely with his description, but the head is not slightly punctured, as he states his specimens to be.

[Both *C. ligatus* and *C. carinatus* are included as races of *C. vinctus*, Weber, by Le Conte, in his List of Coleoptera, p. 3.]

(To be continued.)

MISCELLANEOUS NOTES.

EGGS OF THE CECROPIA MOTH.—I should like to call the attention of the readers of the *Canadian Entomologist* to the fact, that *Platysamia cecropia*, Grote *(Attacus cecropia*, Linn.) always lays two eggs close together upon the food plant of its larva. When seeking for these larvæ early in the season you will usually find them both near to each other, and upon careful examination of the leaves in the vicinity you will find their eggs cemented to the underside, sometimes however upon the upper. They are about ·07 long, oval, somewhat flattened on top. They are not as round as *T. polyphemus* or *A. luna*. Colour yellowish white, with a light brown spot on top, and discoloured more or less at the bottom and sides. They are usually laid side by side. The larva gnaws a rough sided hole through the end and is nearly black, growing lighter each moult until of the normal colour. The larva when about to shed its skin deposits in a convenient place sufficient silk to firmly attach its posterior prolegs, and never should be dis-

turbed when in this position, because it depends upon this attachment to draw itself from the old larva skin. Of six pairs which I tried to raise from the eggs in only one case was I successful, not because they are difficult to rear, for I have had very excellent success heretofore, but I was obliged to trust to inexperienced hands for a short time, and they were not properly fed. This pair are now in the cocoon, and I anticipate that they will come out ♂ and ♀, presuming this to be the law of their nature from the fact of there being two eggs laid together. I hope for further facts the coming season, and that those who have conveniences for raising larvæ will give their attention to the subject.—PHILIP S. SPRAGUE, Boston, Mass.

INSECTS AS FOOD.—In this utilitarian age perhaps the most important question in entomology is to find out in what way insects can be employed for the benefit of mankind. A most curious instance has lately come to my knowledge which I think may interest some of our readers. My informant, M. Guerin-Meneville, a well known sericulturist and economic entomologist, showed me some dark-coloured cakes resembling somewhat brown bread. These cakes are eaten extensively among the poorer classes and natives in the City of Mexico. They are made exclusively with the eggs of two kinds of water-bugs (*Corixa femorata* and a species of *Notonecta.*) The natives cut quantities of reeds and other aquatic weeds, and strew them on the borders of the great lake near the city, and they are soon coated with eggs laid by the insects. These eggs, which are about the size of a mustard-seed, are deposited so abundantly as often to cover the plants entirely. The natives "harvest" these plants, and after exposing them some time in the sun to dry, scrape off the eggs, and either keep them in that state for future use or pound them at once into meal. The perfect insects themselves are not neglected, for they are caught in great numbers and hawked about the streets as food for cage-birds and poultry, which are very fond of them. It is surprising that the raids which are practised against these insects in two of their states do not apparently diminish their numbers; they, however, multiply to such a degree, that notwithstanding the tribute they have to pay, enough survive to supply the natives with food year after year. M. Guerin-Meneville received samples of the insects, the eggs, "seed," meal, and cakes; but unfortunately the latter accidentally became saturated with spirits of wine in which a snake had been preserved, so that it was impossible to taste them.—*E. L. Ragonot, 33 Rue de Buffon, Paris (Science Gossip).*

We hear that the "Ladybirds," which excited so much curiosity last autumn, have reappeared in large numbers in the neighborhood of New Wandsworth. So early an appearance will surprise most of us who have been wont to regard these visitors as summer guests.—*Nature*, March 3.

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 66.)

PHALACRIDÆ.
OLIBRUS, *Er.*
*Bicolor, *Er.*
*Pallipes, *Say?*
NITIDULIDÆ.
CERCUS, *Latr.*
*Abdominalis, *Er.*
BRACHYPTERUS, *Kugel.*
Urticæ, *Fab.*
COLASTUS, *Er.*
*Semitectus, *Say.*
*Unicolor, *Say.*
Truncatus, *Rand.*
CARPOPHILUS, *Leach.*
Niger, *Say.*
Discoideus, *Lec.*
CONOTELUS, *Er.*
*Obscurus, *Er*
EPURÆA, *Er.*
*Nigra, *Maklin.*
Helvola, *Er.*
Boreela, *Er.*
NITIDULA, *Fab.*
Bipustulata, *Fab.*
OMOSITA, *Er.*
Colon, *Linn.*
PHENOLIA, *Er.*
Grossa, *Fab.*
STELIDOTA, *Er.*
*Octomaculata, *Say.*
CRYPTARCHA. *Shuck.*
Ampla, *Er.*
IPS, *Fab.*
Fasciatus, *Oliv.*
4-Signatus, *Say.*
*Obtusus, *Say.*
Sanguinolentus, *Oliv.*
Confluens, *Say.*
Dejeanii, *Kirby.*
PITYOPHAGUS, *Shuck.*
Bipunctatus, *Say.*
RHIZOPHAGUS, *Herbst.*
*Dimidiatus, *Mann.*
*Remotus, *Lec.*
MONOTOMIDÆ.
BACTRIDIUM, *Lec.*
Nanum, *Er.*
*Striatum, *Lec.*
MONOTOMA, *Herbst.*
Parallelum, *Lec.*
TROGOSITIDÆ.
ALINDRIA, *Er.*
Cylindrica, *Enc.*
TROGOSITA, *Oliv.*
*Corticalis, *Mels.*
*Intermedia, *Horn.*
Dubia, *Mels.*
*Collaris, *Sturm.*
Castanea, *Mels.*
Laticollis, *Horn.*
Bimaculata, *Mels.*
NOSODES, *Lec.*
Silphides, *Newm.*[1]
PELTIS, *Kug.*
*Fraterna, *Rand.*
4-Lineata, *Mels.*
THYMALUS, *Latr.*
Fulgidus, *Er.*
COLYDIIDÆ.
DITOMA, *Illig.*
4-Guttata, *Say.*
SYNCHITA, *Hellw.*
*Fuliginosa.
CICONES, *Curtis.*
Marginalis, *Mels.*
COLYDIUM, *Fab.*
*Lineola, *Say.*
BOTHRIDERES, *Er.*
*Geminatus, *Say.*
ENDECTUS, *Lec.*
*Hæmatodes, *Fab.*[2]
CERYLON, *Latr.*
Unicolor, *Zieg.*
Angustulum, *Lec.*
RHYSSODIDÆ.
RHYSSODES, *Dalm.*
*Exaratus, *Ill.*
CUCUJIDÆ.
SYLVANUS, *Steph.*
Surinamensis, *Linn*
NAUSIBIUS, *Redt.*
*Dentatus, *Mars.*
CATOGENUS, *Westw.*
Rufus, *Fab.*

* Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

[1] A single specimen picked up on the shore of the lake, October 1, 1868.

[2] Under pine bark, May 27th.

CUCUJUS, *Fab.*
Clavipes, *Fab.*
PEDIACUS, *Shuck.*
Planus, *Lec.*
*Subglaber, *Lec.*
LÆMOPHLŒUS, *Lap.*
Biguttatus, *Say.*
Fasciatus, *Mels.*
Adustus, *Lec.*
*Geminatus, *Lec.*
DENDROPHAGUS, *Sch.*
Glaber, *Lec.*
BRONTES, *Fab.*
Dubius, *Fab.*
CRYPTOPHAGIDÆ.
ANTHEROPHAGUS, *Latr.*
Ochraceus, *Mels.*
TOMARUS, *Lec.*
*Pulchellus, *Lec.*
PARAMECOSOMA, *Curtis.*
Denticulata, *Lec.*
Inconspicua, *Lec.*
DERODONTIDÆ.
DERODONTUS, *Lec.*
Maculatus, *Mels.*
LATHRIDIIDÆ.
LATHRIDIUS, *Ill.*
*Pulicarius, *Mels.*
*Minutus, *Linn.*
CORTICARIA, *Marsh.*
*Cavicollis, *Lec.*
*Pumila, *Mels.*
MYCETOPHAGIDÆ.
MYCETOPHAGUS, *Hellw.*
Punctatus, *Say.*
Flexuosus, *Say.*
Pluripunctatus, *Lec.*
*Obsoletus, *Mels.*
*Bipustulatus, *Mels.*
TRIPHYLLUS, *Latr.*
Ruficornis, *Lec.*
LITARGUS, *Er.*
Sexpunctatus, *Say.*
TYPHÆA, *Curtis.*
*Fumata, *Linn.*[3]
DIPLOCŒLUS, *Guér.*
*Brunneus, *Lec.*[4]
DERMESTIDÆ.
DERMESTES, *Linn.*
Caninus, *Germ.*
Nubilus, *Say.*
Pulcher, *Lec.*[5]
Lardarius, *Linn.*
ATTAGENUS, *Latr.*
Megatoma, *Fabr.*
TROGODERMA, *Latr.*
*Ornatum, *Say.*[6]
ANTHRENUS, *Fab.*
Varius, *Fab.*
ORPHILUS, *Er.*
Ater, *Er.*
BYRRHIDÆ.
CYTILUS, *Er.*
Varius, *Fab.*
BYRRHUS, *Linn.*
Kirbyi, *Lec.*
Americanus, *Lec.*
*Cyclophorus, *Kirby.*
Geminatus, *Lec.*
LIMNICHUS, *Latr.*
Punctatus, *Lec.*[7]
PARNIDÆ.
HELICHUS, *Er.*
Striatus, *Lec.*
Lithophilus, *Germ.*
STENELMIS, *Duf.*
Crenatus, *Say.*
LIMNIUS, *Müll.*
*Fastiditus, *Lec.*
ELMIS, *Latr.*
Vittatus, *Mels.*
HETEROCERIDÆ.
HETEROCERUS, *Fab.*
Mollinus, *Kies.*
LUCANIDÆ.
LUCANUS, *Linn.*
Dama, *Thunb.*
Placidus, *Say.*
DORCUS, *McL.*
Parallelus, *Say.*
PLATYCERUS, *Geoff.*
Quercus, *Weber.*
Depressus, *Lec.*
CERUCHUS, *McL.*
Piceus, *Weber.*
PASSALUS, *Fab.*
Cornutus, *Fab.*
SCARABÆIDÆ.
CANTHON, *Hoff.*
Lævis, *Drury.*
COPRIS, *Geoff.*
Anaglypticus, *Say.*
ONTHOPHAGUS, *Latr.*
Latebrosus, *Fab.*

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[3] Found in scores under rails from which a hay-stack had been removed; January and April.

[4] In moss on a fallen maple tree; latter part of July.

[5] Taken in January under the bark of a dead elm.

[6] Bred from larvæ found in a case of insects.

[7] Found under stones at the margin of a creek; in July.

*Canadensis, *Fab.*
APHODIUS, *Ill.*
Fimetarius, *Linn.*
*Ruricola, *Mels.*
Granarius, *Linn.*
Vittatus, *Say.*
Inquinatus, *Fab.*
*Stercorosus, *Lec.*
Bicolor, *Say.*
*Oblongus, *Say.*
Striatulus, *Say.*
EUPARIA, *Lep.*
Stercorator, *Fab.*
*Cognata, *Lec.*
ODONTÆUS, *Klug.*
Cornigerus, *Mels.*
GEOTRUPES, *Latr.*
Egeriei, *Germ.*
Excrementi, *Say.*
Splendidus, *Fab.*
Blackburnii, *Fab.*
NICAGUS, *Lec.*
Obscurus, *Lec.*
TROX, *Fab.*
Sordidus, *Lec.*
Porcatus, *Say.*
Erinaceus, *Lec.*
Capillaris, *Say.*
Æqualis, *Say.*
HOPLIA, *Ill.*
Trifasciata, *Say.*
DICHELONYCHA, *Kirby.*
Elongatula, *Schon.*
Albicollis, *Burm.*
SERICA, *McL.*
Vespertina, *Schon.*
Sericea, *Ill.*
MACRODACTYLUS, *Latr.*
Subspinosus, *Fab.*
DIPLOTAXIS, *Kirby.*
Tristis, *Kirby.*
LACHNOSTERNA, *Hope.*
Fusca, *Frohl.*
Cognata, *Burm.*
*Subtonsa, *Lec.*
*Hirsuta, *Knoch.*
*Villifrons, *Lec.*
PELIDNOTA, *McL.*
Punctata, *Linn.*
COTALPA, *Burm.*
Lanigera, *Linn.*
LIGYRUS, *Burm.*
Relictus, *Say.*
APHONUS, *Lec.*
*Tridentatus, *Say.*
Frater, *Lec.*
XYLORYCTES, *Hope.*
Satyrus, *Fab.*
EURYOMIA, *Burm.*
Inda, *Linn.*
Fulgida, *Fab.*
OSMODERMA, *Lep.*
Eremicola, *Knoch.*
Scabra, *Beauv.*
GNORIMUS, *Lep.*
Maculosus, *Knoch.*
TRICHIUS, *Fab.*
Affinis, *Gory.*

EXCHANGES.

SILK MOTHS.—Eggs of *B. Yama-mai*, *Pernyi*, and of the white variety, free from disease, also of *B. mori*, for rare species of Canadian Lepidoptera.—W. V. ANDREWS, Room 17, No. 137 Broadway, New York.

COLEOPTERA.—Species desired from Canada, especially the eastern region; can give in exchange Southern and Californian forms, as well as those from New England States. —P. S. SPRAGUE, 227 Broadway, South Boston, Mass.

BOOKS RECEIVED.

Hand-book of Zoology, with examples from Canadian Species, Recent and Fossil. By J. W. Dawson, LL.D., F. R. S., &c. Part i.—Invertebrata. With 275 illustrations. Montreal: Dawson Brothers, 1870. Toronto: Adam & Stevenson. We are glad to welcome another addition to the scientific literature of Canada from the pen of Dr. Dawson, Principal of McGill College, the well-known author of Acadian Geology, Archaia, etc. The little work before us is an elementary treatise on Zoology designed for the use of teachers and isolated students or collectors, and will, we are sure, prove o much value to all beginning the study of the natural history of this country or engaged in the instruction of others. The copious illustrations from Canadian examples render it

particularly useful, as we have generally to resort to British or American publications for scientific information of an elementary character. The work opens with an outline of Physiological Zoology, and an account of Zoological Classification, with divisions into Provinces and Classes based upon the system of Cuvier; the greater part of the volume is occupied with illustrated descriptions of the leading divisions of Radiata, Mollusca and Articulata. In an appendix is given an outline of the classification of Vertebrata, and also valuable instructions for collecting and preserving invertebrate animals. Should the present volume be well received—which we earnestly trust will be the case—the author purposes completing the work by another on the Vertebrata.

The Canada Bookseller: A Quarterly Record of British, American and Native Literature, for the use of the trade and book-buyers: published by Adam, Stevenson & Co., Toronto. March, 1870 (50 cents per annum). We beg to commend to our book-buying and book-loving friends this beautifully printed venture of a most enterprising Canadian firm. It contains much interesting matter relating to the trade, and full information respecting recent or forthcoming publications by Canadian, British and Foreign houses. It is certainly one of the best specimens of typography ever issued in this country.

The American Entomologist. Vol, ii. No. 5. March, 1870. In addition to the usual supply of varied and interesting matter, including several contributed articles, the Editor of this valuable periodical presents us with an admirable steel-plate portrait of his late esteemed coadjutor, Benj. D. Walsh.

Second Annual Report on the Noxious, Beneficial, and other Insects of the State of Missouri. By Charles V. Riley, State Entomologist. Jefferson City: H. Wilcox, 1870. Much of the matter contained in this valuable Report has very naturally appeared already in the pages of the *American Entomologist*, of which the Author is now sole Editor, and is therefore not entirely new to us; it is a great convenience, however, to have the matter thus collected together in moderate compass and in a systematic form, while to those who do not see the magazine, and who yet are interested in the economic study of insects, the treatise must be invaluable. It is illustrated by about a hundred excellent wood-cuts, and contains accounts of the Chinch Bug, the Army Worms, Tortoise-Beetles, the Pickle Worm, Insects injurious to the grape-vine, the Canker-Worm, Cabbage Worms, etc. The following new species of insects are described and figured in the course of the volume:—Diptera, *Exorista flavicauda*, and *Asilus Missouriensis*; Lepidoptera, *Plusia brassicæ*, and *Acronycta populi*.

The Bowdoin Scientific Review. A fortnightly Journal, edited by Professors Brackett & Goodale, Bowdoin College, Brunswick, Maine, and devoted chiefly to Chemistry and Physiology.

Twenty-second Annual Report of the Regents of the University of the State of New York, on the condition of the State Cabinet of Natural History. Albany, 1869 (from Mr. J. A. Lintner).——*Proceedings of the Boston Society of Natural History.* Vol. xiii., pages 193 to 224——*Hardwicke's Science Gossip.* No. 63, March, 1870.——*Nature.* Nos. 16 to 21.——*Le Naturaliste Canadien.* Vol.

ii., No. 4.——*The American Naturalist.* Vol. iii, No. 12; Vol. iv., No. 1.——*The Rural New Yorker.*——*The American Agriculturist.*——*The Canada Farmer.*——*The Maine Farmer.*——*The Bunker Hill Aurora.*——*The Oread.*——*Arthur's Home Magazine* and *The Children's Hour.*——*Petites Nouvelles Entomologiques.*

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COLEOPTERA FROM THE UPPER AMAZON.—I have a pretty large collection of Coleoptera from the Upper Amazon for sale, in sets of 25 specimens and upwards, including many species seldom found in collections.—JOHN AKHURST, 9½ Prospect Street, Brooklyn, N. Y.

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AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper; Naturalist, Ottawa, Ont.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; R. Trestrail & Son, The Bazaar, Dixon, Ill.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

ENGLAND.—Wm. Wesley, 81 Fleet Street, London, E. C. Subscription 5s. per Vol.

FRANCE.—E. Deyrolle, fils, 19 Rue de la Monnaie, Paris. Subscription 8 francs.

one in the Library of Parliament at Ottawa, is the only copy we know of in Canada. By the kindness of Prof. Croft we have obtained a loan of the copy belonging to the University, and, with the full approbation of many of our friends and correspondents, we now purpose republishing from it in the pages of the *Canadian Entomologist* Kirby's descriptions of new species, and such other matter as may be deemed of special value or interest. As the work consists of upwards of 300 quarto pages, it will be necessary for us to omit almost everything except the descriptions of species that cannot be obtained elsewhere, in order to accomplish the republication within a reasonable time, and without trespassing too much upon our limited space. Though we shall thus depart a little from our expressed intention of only publishing original matter in this Journal, we feel assured that all our readers will be pleased to have brought before them descriptions of Canadian insects to which they can hardly otherwise obtain access. For convenience of reference the paging of the original work, and any notes we may add, will be enclosed in square brackets.

[8] FAMILY CICINDELIDÆ.

* *Labrum unidentate.*

1. CICINDELA HIRTICOLLIS, *Say.*—Locality not stated. [For description *vide* Say's Ent. ii. 423.]

[9] 2. CICINDELA REPANDA, *De Jean.*—Locality not stated.

Very like the preceding species, but the labrum is shorter and less prominent in the middle; the lateral margin of the elytra is not continuously white; the lower limb of the humeral crescent slopes towards the apex of the elytrum; the broken or S-shaped band terminates in a streak at the margin: all the markings also of the elytra are buff colored rather than white; and the minute mucro or point that terminates the suture, and the serrulations of the apex of the elytra are less conspicuous.

De Jean regards this species as synonymous with *C. hirticollis*, but, if I am correct in my reference to him, of which I have little doubt, they are clearly distinct.

3. CICINDELA PROTEUS, *Kirby.*—Length of body 5¾ lines. This species, of which several specimens were taken in the expedition, appears to abound in North America. Dr. Bigsby met with it in Canada, and there was a specimen in the late Mr. Marsham's collection, probably from the United States.

Similar to *C. repanda*, but instead of the humeral and terminal crescents, in all the varieties, are four white dots, two at the base and two at the apex of the elytra; the middle broken or tortuous band resembles the figure 7 reversed, and does not terminate in a marginal streak. The body

underneath, as usual, is golden-green, or green with clouds of blue, above it is dark-brown with a tint of copper.

Variety B. With the apical dots not larger than the humeral.

C. With an interrupted crescent at the apex.

D. With three apical and two humeral dots; intermediate band internally abbreviated.

E. Like the last, but with only one humeral dot.

[This is *C. duodecim-guttata*, Dej.; it is commonly taken in many parts of Canada.]

* *Labrum tridentate.*

[10] 4. CICINDELA OBLIQUATA, *De Jean.*—Many taken in the expedition, and apparently abundant in N. America. I received it many years since, but without a name, from my lamented friend Prof. Peck.

Body above greenish-copper, underneath golden-green clouded with blue. Labrum white, tridentate, slightly prominent in the middle; mandibles white at the base, black at the tip; palpi black; labial with the intermediate joint rufous, darker at the tip. Elytra with a large white humeral crescent, extended at the lower end obliquely beyond the middle; mesal band bent downwards, recurved at the end, and connected by a marginal line with a crescent at the apex. In the male the intermediate joint of the labial palpi is white, and the mesal band is not connected with the terminal crescent.

[Le Conte (Pro. Acad. Nat. Sci. Phil., Dec. 1866, p. 362) states that this species should hereafter be known as *C. Kirbyi*, since, as he learns from a drawing made by Mr. Andrew Murray, from the type in the British Museum, it is quite distinct from any species known to him.]

5. CICINDELA VULGARIS, *Say.*—A common species in all N. America.

[11] 6. CICINDELA PURPUREA, *Oliv.*—[Very common in most parts of Canada,]

[12] 7. CICINDELA ALBILABRIS, *Kirby.* Plate i, fig. 1.—Taken in lat. 64°, and also in Canada by Dr. Bigsby. [Previously described as *C. longilabris*, by Say. (Ent. Works, i. 176). We have received specimens of this species from Nova Scotia, collected by Mr. J. M. Jones, and from Quebec and New Hampshire.]

[FAMILY CARABIDÆ.]

[13] 8. CASNONIA PENNSYLVANICA, *De Jean.*—Two specimens taken.

9. CYMINDIS MARGINATUS, *Kirby.*—Piceous, thickly punctured; antennæ, mouth, dilated sides of the prothorax, lateral margin and shoulders of the striated elytra, and legs, rufous. Length of the body 4½ lines.

One specimen of this insect was taken in the route from New York to Cumberland House, and the other in lat. 65°. It is nearly related to *C. pubescens*, Dej., but appears distinct.

[14] Body depressed and flat, as in its congeners, piceous; above densely punctured; mouth rufous; antennæ longer than the prothorax, piceo-rufous: front between the eyes transversely wrinkled: prothorax convex, with a longitudinal channel; lateral margin dilated, reflexed, and rufous: elytra striated or slightly furrowed, with the furrows and their interstices punctured; viewed on one side they appear hairy with upright ferruginous hairs; their shoulders and lateral margin are obscurely rufous; their apex obliquely truncated, and subemarginate; the legs are rufous.

Var. B. Piceo-rufous; elytra concolorate.

[In Melsheimer's Catalogue, p. 4, this species is put down as a synonym of *C. cribricollis*, Dej., and in LeConte's List, p. 6, with a mark of interrogation under *C. reflexa*, Lec. The latter author, however, subsequently states (Trans. Am. Ent. Soc., Feb., 1869, p. 244), that both *C. Marginata*, Kirby, and *C. reflexa*, Lec., are identical with *C. cribricollis*, Dej. The species occurs in the most northern part of the United States and in Canada.]

10. CYMINDIS UNICOLOR, *Kirby*.—Thickly punctured, ferruginous; legs paler; lateral margin of the thorax not dilated. Length of the body 3½ lines. One specimen only taken.

This species greatly resembles variety B of the preceding. It is however smaller and paler; the prothorax has no longitudinal channel, and its lateral margin is not dilated.

[Placed, with a mark of interrogation, as a synonym of *C. neglecta*, Hald., in LeConte's List, p. 6.]

Genus SERICODA, *Kirby*.

Labrum transverse, sub-quadrangular: with the anterior angles rounded. *Mandibles* acute, incurved at the apex, not toothed? *Labium* [*mentum*] emarginate with a minute tooth in the sinus. *Palpi*: *maxillary* 5-jointed; first joint very minute, second longer than the rest, sub-cylindrical, attenuated at the base; third ob-conical; fourth as long as the third, fusiform, truncate; fifth very minute, retractile within the fourth; *Labial* 3-jointed; joints nearly equal in length; the two first conical; the last fusiform, truncated. *Antennæ* rather incrassated toward the apex; scape[1] incrassated; 2nd joint the shortest, and the third rather longer than the others.

[15] *Body* depressed, narrow. *Head* triangular. *Eyes* large and prominent. *Neck* very little constricted. *Prothorax* short, channelled, widest anteriorly: with the angles rounded. *Elytra* obliquely truncated at the apex and emarginate, so that internally they terminate in an acumen. *Cubit*

[1] *Scape.* The first, and often most conspicuous joint of the antennæ, terminating below in the bulb, which inosculates in the head and acts the part of a rotula. [Definitions, &c., p. xviii.]

Body black, glossy. Antennæ, mouth, mandibles, and palpi pale chesnut or mahogany colour; the former more dilute at the apex; front with three or four slight furrows between the eyes; upper-lip very short; prothorax heart-shaped, constricted posteriorly, convex in the disk; sides and base depressed and lightly punctured: elytra dark piceous, striated or slightly furrowed: furrows very obsoletely punctured; interstices very flat; between the 2nd and 3rd furrows, adjoining the latter, are from three to five shallow but rather large impressions: the legs are slender, of a pale chesnut or mahogany colour, in one of the specimens the thighs are darker than the rest of the leg. *N. B* —In one specimen there are three and in the other five impressions.

18. CHLÆNIUS SERICEUS, *Forst.*—[Say's Ent. Works, ii. 483.]—Several taken in the journey from New York to Cumberland-house. In Canada by Dr. Bigsby. [Very common throughout Canada.]

[21] 19. CHLÆNIUS IMPUNCTIFRONS, *Kirby.*—[This name is pre-occupied by Say; Kirby's species is probably identical with LeConte's *C. brevilabris.*] Length of body 5-5¾ lines.

Smaller than *C. sericeus*, though like it. Head without punctures; antennæ black, with the three first joints testaceous: scutellum not acuminate: elytra black with with a shade of green; apex of the epipleuræ or side-covers and legs testaceous; coxæ chesnut. In other respects this agrees with the preceeding species.

20. CHLÆNIUS NEMORALIS, *Say.*— [Ent. Works, ii. 487]

A pair taken in the journey from New York to Cumberland-house. [Rare in Canada.]

[22] 21. CHLÆNIUS QUADRICOLLIS, *Kirby.*—Length of the body six lines. Taken by Dr. Bigsby in Canada.

Body hairy like the others, black underneath. Head and prothorax bronzed-green; mandibles piceous; palpi and three first joints of the antennæ testaceous; the latter are longer than the thorax, with the 4th joint as long as the 3rd; prothorax rather square, a little narrower before, with the sides curving, sculptured like the preceding species; scutellum sub-acuminate; elytra blue-black, furrowed with deeper furrows very visibly punctured, interstices minutely punctured.

[Placed, with a mark of interrogation, as a synonym of *C. Pensylvanicus*, Say, in Le Conte's List, p. 11.]

22. CHLÆNIUS CORDICOLLIS, *Kirby.*—Length of the body 8 lines. Taken in Canada by Dr. Bigsby.

Body black. Head impunctured; palpi rufous; antennæ dusky, with the three first joints rufous, the third much longer than the fourth: prothorax

obcordate, constricted behind, deeply channelled, disk gibbous on each side of the channel, centre of each gibbosity smooth, remainder of the prothorax punctured; posterior lateral impression longitudinal: elytra black with a shade of green, sculptured as in the preceeding species, but the interstices of the furrows are more visibly punctured: legs testaceous, thighs darker.

[23] 23. CHLÆNIUS EMARGINATUS, *Say.*—Length of the body 6¾ lines. Taken in the journey from New York to Cumberland-house.

Body hairy, punctured; black underneath. Head glossy green, with a tint of copper between the eyes, and a net-work of very minute, confluent, transverse wrinkles; maxillæ and palpi rufous, maxillary palpi very long; upper-lip transverse, rufo-piceous, anteriorly subemarginate; madibles piceous; antennæ rufous, longer than the prothorax, with the third joint rather longer than the 4th; prothorax dusky-green, transverse, rather narrowest at the apex, very thick and minutely punctured; basilar impressions double, the inner one the longest; elytra black with a very faint tint of blue: legs rufous.

This is most probably the *C. emarginatus* of Say, but it does not exactly accord with De Jean's species. [Say's *C. emarginatus* belongs to the genus *Anomoglossus*, Chaud.; the species here described is *C. impunctifrons*, Say.]

24. PLATYNUS ANGUSTICOLLIS, *DeJean.*—Length of the body 5 lines. Taken in lat. 54° and 65°. Not uncommon in Britain.

[24] Body very black, glossy, somewhat narrowed. Head smooth, [illegible] than the prothorax, including the neck sub-rhomboidal, without [illegible] palpi and antennæ piceous; frontal impressions large; prothorax [illegible] than the elytra, obcordate, longer than wide; dorsal channel [illegible] anteriorly in a transverse obtuse angular impression; lateral [illegible] especially at the base, reflexed, somewhat piceous in a [illegible] impressions single, large, round, with a few scattered [illegible] elytra rather deeply furrowed; furrows very slightly [illegible] second and third are two punctiform impressions, the [illegible] to the former furrow, and the posterior to the latter.

[This is considered an erroneous determination [illegible] head is inserted by [illegible] race of *P. sinuatus*. [illegible]

25. [illegible] EXTENSICOLLIS [illegible] taken in [illegible]

26. [illegible]

following species, oblong-ovate, with the lateral margin piceous, and not dilated posteriorly as in the majority; basilar impressions rather shallow, oblong: elytra oblong, rufo-piceous slightly furrowed, furrows impunctured; five punctiform impressions between the second and third; the three anterior ones adjacent to the latter, and the two posterior to the former: legs dusky rufous.

Variety B. With only four punctiform impressions, legs paler.

C. With the 2nd, 3rd and 4th joints of the antennæ piceous, the rest ferruginous: impressions of the elytra as in B.

D. Larger, elytra with five impressions, in other respects like C.

This species appears very like *A. lenum*, Dej., which is also North American, but the colour of the underside of the body and of the head and prothorax is different. [Belongs to *Platynus*.]

27. AGONUM SORDENS, *Kirby*.—Length of the body three lines. Two specimens taken in lat. 54°

Body black, glossy. Head rhomboidal; mouth, mandibles at the tip, palpi at the base, and scape of the antennæ, rufous; frontal impressions very slight: prothorax scarcely longer than wide, narrowest behind; dorsal channel rather deep; lateral margin underneath testaceous; basilar impressions oblong, deepish: elytra dusky-testaceous, in one specimen a little bronzed, slightly furrowed, furrows impunctured; between the second and third are five punctiform impressions placed as in the last species: epipleura and legs testaceous.

[26] AGONUM MELANARIUM, *De Jean*.—Length of the body 4¾ lines. Taken in lat. 54°.

Body black, glossy. Mandibles at the tip, mouth and scape of antennæ piceous: prothorax nearly as long as wide; disk transversely wrinkled; lateral margin at the base much dilated, rather incrassated, and sub-angular; posterior impressions large and distinctly punctured: elytra wider than the prothorax, sub-emarginate at the base; distinctly furrowed with very minute and inconspicuous punctures in the furrows; three punctiform impressions in the third furrow from the suture: legs piceous.

This species is the American representative of *A. versutum*, which it much resembles. [Belongs to *Platynus*; taken at Ottawa by Mr. Billings.]

29. AGONUM SEMINITIDUM, *Kirby*.—Length of body 4½ lines. Taken in lat. 54°.

Body smooth, glossy, black underneath. Head greenish-bronzed, very glossy, with frontal impressions lunular; antennæ longer than the prothorax; prothorax greenish-bronzed with a copper tint, very glossy, channelled, disk transversely and minutely wrinkled; basilar impressions longitudinal, lateral

margin, particularly at the base, reflexed: elytra black-bronzed, less glossy than the head and prothorax, lightly furrowed; furrows punctured; in the interstice between the second and third furrows are five punctiform impressions, two nearer the base and three nearer the apex of the elytrum, so that the interval between the second and third is greater than that between the others.

Variety B. Second and third punctiform impressions not more distant than the others. In this specimen, on the left hand elytrum, there are only four impressions and on the other five, but in neither are the second and third situated as in A. It may be a distinct species, but I can discover no other difference.

[27] 30. AGONUM SIMILE, *Kirby*.—Length of the body 3¼ lines. Locality not stated.

Body glossy, underneath very black, above black slightly bronzed. Antennæ scarcely longer than the prothorax: prothorax rather longer than broad; basilar impressions roundish, impunctured: elytra more bronzed than the head and prothorax, lightly furrowed; furrow adjoining the suture more depressed and deeper than the rest; in the space between the second and third furrows are five equi-distant punctiform impressions, the two anterior adjoining the latter furrow, and the three posterior the former.

This little species greatly resembles *A. seminitidum*. It is however much smaller, less bronzed, the prothorax is longer in proportion, the sutural furrow is deeper, and the impressions are differently arranged.

AN INSECT FRIEND.

Arma placidum, Ulke.

a

The accompanying figure correctly represents the mature form of the friendly bug referred to in the "Canadian Entomologist," Vol. ii. No. 2, which was found feasting so energetically on the larvæ of the gooseberry saw fly (*Nematus ventricosus*). For a description of the appearance and habits of the immature form of this beneficial insect the reader is referred to the above number of the "Canadian Entomologist."

The perfect insect has been determined by Mr. Ulke, of Baltimore, Md., who found it to be an undescribed species of *Arma*, to which he has given the specific name *placidum*. Hence our friend will in future be known as *Arma placidum*, Ulke

The excellent drawing of the insect is the work of our esteemed and able friend, C. V. Riley, Esq., State Entomologist of Missouri, who has kindly

furnished us with an electrotype of the plate for the use of this journal. The smaller figure is the natural size of the bug, the larger one a magnified representation of the same. W. SAUNDERS, London, Ont.

HINTS ON DESCRIBING CATERPILLARS.

BY W. SAUNDERS, LONDON, ONT.

When comparing descriptions of larvæ made by different writers, the labor of the student is often greatly increased by the want of order and method in their compilation. With a view of simplifying details and lessening labor, the following suggestions are offered, with the hope that they may serve to stimulate some to enter earnestly into this interesting branch of our favorite study.

When we take up a caterpillar with the intention of describing it, the many ornamentations, markings and diversities of color belonging to it, are sometimes quite confusing, unless we begin to classify them, when the most complex appearance is soon markedly simplified. We have for some time past made it a rule to take descriptions precisely in the following manner and order. First, the full *length* of body when in motion; then *form*, whether cylindrical, onisciform, or otherwise; if strongly annulated or ringed, a note is made of that also.

Beginning with the *head*, which we call the first segment—making the total number thirteen—take first its size, large, medium, or small. Next form, flattened, rounded, or pointed, and whether strongly bilobed or not. Then color, markings and appendages, such as spines or hairs; giving also the color of mandibles.

Commencing the body with the upper surface, give first its general color; next markings, such as stripes, lines or spots, working from anterior to posterior segments; then ornamentations or appendages, such as hairs, spines, horns, tubercles or granulations, with their size, form and color.

Under surface—first general color, then markings, &c., finishing with color and form of feet and prolegs.

By steadily observing a particular arrangement of this sort, descriptions may readily be compared with one another and their identity or distinctness established with little labor.

It is also an excellent plan to underline some of the most prominent and striking features in the appearance of a larva, by which one may often at a glance decide whether it is likely that a certain caterpillar before you is or is not identical with a particular description. In Stainton's "Manual of Butterflies and Moths" this plan is carried out, and the prominent characteristics thus given in a few italicised words will frequently relieve one of the labor of reading a description throughout.

LIST OF LEPIDOPTERA TAKEN AT QUEBEC.

BY G. J. BOWLES.

PAPILIONIDÆ

1. Papilio turnus, *Linn.*

PIERIDÆ.

2. Pieris oleracea, *Harr.* (rare).
3. rapæ, Linn.
4. Colias philodice, *Godt.*
5. eurytheme (Chrysotheme ?) *Boisd* (very rare).

DANAIDÆ.

6. Danais archippus, *Fab.* (rare).

NYMPHALIDÆ.

7. Argynnis cybele, *Godt.*
8. myrina, *Cram.*
9. bellona, *Godt.* (very rare).
10. aphrodite, *Godt.*
11. Melitæa phæton, *Cram* (rare).
12. Harrisii, *Scudder.*
13. tharos, *Cram.*
14. Grapta interrogationis, *Godt.* (very rare).
15. comma, *Harr.*
16. faunus, *Edwards.*
17. Vanessa J-album, *Boisd & Lec.*
18. Milberti, *Encyc.*
19. progne, *Cram.*
20. antiopa, *Linn.*
21. Pyrameis atalanta, *Linn.* (rare).
22. cardui, *Linn.*
23. Huntera, *Sm.*
24. Limenitis arthemis, *Drur.*

SATYRIDÆ.

25. Chionobas jutta, *Moschler, (C. Balder, Boisd. & Lec.)*
26. Neonympha Boisduvallii, *Harr.*
27. Erebia nephele, *Kirby.*
28. Satyrus alope, (?) *Fab.*

LYCÆNIDÆ.

29. Thecla Augustus, *Kirby.*
30. clothilde, *Edwards.*
31. Polyommatus Americana, *D' Urb.*
32. epixanthe, *Boisd & Lec.*
33. lucia, *Kirby.*

HESPERIDÆ.

34. Eudamus tityrus, *Smith* (v. rare).
35. bathyllus, *Smith.*
36. Nisoniades brizo, *Boisd & Lec.*
37. catullus, *Smith.*
38. Hesperia mystic, *Edwards.*
39. hobomok, *Harr.*
40. wamsutta, *Harr.*
41. abaton, *Harr.*
42. mandan, *Edwards.*

NOTES.

I have followed the authorities given in the Society's list. *Papilio asterias* is common one hundred and fifty miles east and west of Quebec. *Pieris oleracea* is subject to great variation. I have seen specimens with the nervures on the under side as fully covered with greyish scales as *P. napi* of Europe, and others with secondaries of a greenish tinge underneath. *Argynnis Atlantis* has been taken fifty miles west of the city, and on the lower St. Lawrence. Quebec is the only known locality for *Chionobas jutta* in Canada. I retain the two species, *Erebia nephele* and *Satyrus alope*, though some of our best entomologists consider them to be identical. I have never seen a Quebec specimen with the band on the fore wings of a *yellow* colour. Those

that I have (hesitatingly) labelled *S. alope* have a perceptible band of a brown colour, a shade lighter than the rest of the wing,—those labelled E. *nephele* have no trace of a band. There is certainly a great contrast between the coloration of the latter and the *S. alope* I have received from other localities. Several species will no doubt be added to the Hesperidæ, as those found about Quebec have not been properly studied as yet.

NOTES OF SOME OF THE COMMON SPECIES OF CARABIDÆ, FOUND IN TEMPERATE NORTH AMERICA.

BY PHILIP S SPRAGUE, BOSTON, MASS

ARTICLE NO. III.

Harpalus herbivagus, Say. Long. .37 in. (30 to 40).

Oblong-oval, piceous; legs, mouth, antennæ and sides of prothorax, rufo-testaceous. Head black, shining, rather large; antennæ short, scarcely reaching the base of thorax, the latter nearly twice broader than long, basal angles broadly rounded, sides scarcely depressed at the apical angle, very much so behind, the margin narrowly reflexed, basal foveæ shallow scarcely punctured. Elytra male black shining, female semi-opaque and distinctly reticulate, striæ not deep, interstices somewhat convex, with a dorsal puncture behind the middle near the second stria, apex slightly and obliquely sinuate with a small but distinct sutural spine in the female; beneath rufo-piceous.

In this species the male is decidedly smaller than the female, and the reticulations of the elytra are so fine as to be nearly obsolete, the basal foveæ of the prothorax in some specimens are well defined with a few distinct punctures, but they are usually broad, shallow and smooth, the basal angles above are much flattened and at the margin strongly rounded; in this respect resembling *H. amputatus*. The thorax in some specimens very closely resembles that of *H. opacipennis* in outline, but the latter is more narrowed in front and with the sides not or scarcely depressed, and the elytra of both sexes are reticulate and semi-opaque.

H. foveicollis, Lec., and *H. proximus*, Lec., are varieties. Examples of these are sometimes found in a small series, which make them appear quite distinct, but with larger numbers these differences insensibly merge into the common general form of *herbivagus*. The epipleura in immature specimens are sometimes ferruginous, and in this respect resembling *H. pleuriticus*.

Harpalus pleuriticus, Kirby. Long. .35 inch.

Oval rufo-piceous, shining; legs, mouth, antennæ and epipleura rufo-testaceous. This beetle resembles in size and general characters the preceding, but differs by being lighter colored, more robust (convex); both male and female, are smooth, shining above, with the reticulation of the elytra nearly obsolete,

the thorax behind the middle is subparallel, not broadly rounded, as in *H. herbivagus*, the basal angles nearly right-angles, with only the extreme apex slightly rounded, the sides are feebly depressed, the basal foveæ are well defined and with the margin and basal angles strongly and almost confluently punctured, the elytral striæ are deep and the interstices convex, epipleura ferruginous or testaceous.

Harpalus fallax, Lec. Long, .38 inch.

Oval, black piceous, legs, mouth, antennæ and side margins of prothorax rufo-testaceous. Head and disk of thorax rufo-piceous, the latter at the sides rounded and depressed behind; basal foveæ not very deep with a few fine and scattered punctures; elytra in both sexes shining, deeply striate and the interstices quite convex; epipleura black, *never* testaceous. This beetle is very closely allied to the two preceding, partaking of the characters of both; it is larger than *pleuriticus*, and more robust, but about the size of the female *herbivagus*; the elytra in both sexes are smooth and shining, the thorax is more rounded at the sides than in *pleuriticus*, but less so than in *herbivagus*.

If three series of these beetles be arranged side by side, we shall have

H. pleuriticus, smallest, reddish-brown, convex.

H. herbivagus, male small, black shining; female larger, black, elytra semi-opaque and reticulate.

H. fallax larger, more convex, elytra in both sexes black, shining.

The following table will further assist in determining these closely allied species.

Black piceous, thorax at sides and basal angles strongly rounded, basal foveæ shallow, scarcely punctured, elytra, male, smooth, shining; female reticulate, semi-opaque, striæ shallow.....*herbivagus.*

Rufo-piceous, robust, thorax at sides scarcely rounded or depressed, basal foveæ sufficiently deep with the angles and side margins strongly punctured; elytra reddish-brown, male and female, shining, striae deeper, epipleura usually testaceous.....*pleuriticus.*

Piceous, more robust, thorax at the sides depressed and with the basal angles more rounded, basal foveæ and angles less punctured; elytra, male and female, shining, striæ deep, interstices quite convex, epipleura black, never testaceous.....*fallax.*

Harpalus opacipennis, Hald., Mass. Long, .30 inch.

Elliptical, black opaque; mouth and antennæ testaceous; legs rufo-testaceous. Thorax narrowed in front, sides slightly rounded, scarcely depressed, basal angles nearly rectangular, somewhat rounded, basal foveæ distinct, linear, impunctured, sometimes rugose. Elytra reticulate and opaque in both sexes, striæ fine with a dorsal puncture as in the preceding. This beetle

differs from the others by its smaller size, by having the thorax narrowed forward, and with the elytra giving it a more elliptical form, and by the elytra in both sexes being reticulate and opaque.

Harpalus nitidulus, Chaud., Mo. Common. Long. .20, .28 in.

Elliptical, rufo-piceous shining; legs, mouth and antennæ testaceous. Head and thorax perfectly smooth, the latter narrowed in front, sides and basal angles rounded, sides not depressed, basal foveæ nearly obsolete, not punctured. Elytra smooth and shining in both sexes, striæ not deep, interstices somewhat flattened, with a dorsal puncture as usual. This is our smallest species of the true genus Harpalus.

GALLS FOUND ON PLANTS OF THE GENUS RUBUS.

BY H. F. BASSETT, WATERBURY, CONN.

I think the gall described in the last number of the *Entomologist*, by Mr. Wm. Couper, as found on the roots of the raspberry, has never been noticed before. I have in my collection a species of gall fly, hitherto undescribed, belonging to the genus Diastrophus, which I reared in great numbers from galls found on the roots of *Rubus villosus*, the common blackberry; these galls were polythalamous, however, and are undoubtedly distinct from his species.

Mr. Couper says his galls are from the roots of the common raspberry. Does he mean the *Rubus strigosus*, so common in northern New England, or *Rubus occidentalis*, which is the most common species in northern Ohio? or does he refer to some other species? I shall be glad to learn the species and also to receive specimens of the galls and gall insects, as I have made the Hymenopterous gall-flies a special study for several years, and I have several species from this same genus of plants, some of which are undescribed. The only *monothalamous* species yet described as occurring on plants of the genus Rubus, is *Diastrophus cuscutæformis*, O. S. *Diastrophus potentillae*, Bassett, is found on a plant belonging to the same order (Genus *Potentilla Canadensis*) and is monothalamous. It is developed from the axillary buds of the stems.

I submit for publication a description of the Blackberry root gall and gall fly,—Diastrophus radicum, N. Sp.

Galls. On the roots of Rubus villosus, of very irregular shape, and varying in size from those of the shape and size of a pea to those two inches or more in length, and nearly an inch in diameter, and containing few or many larvæ according to size. The galls are occasionally found on the part of the stalks of the blackberry which is below the surface.

Insect, female. *Head* black, smooth, *ocelli* small, *face* black, hairy, the hairs close and converging towards the mouth; *Antennæ* 13 jointed, joints short,

distinct, hairy, and all of nearly equal length, color dull brownish yellow; *Mesothorax* black, shining, smooth, parapsidal grooves not deep, the two short median lines very obscure, a short faint line over the base of each anterior wing; *Scutellum* black, deeply and somewhat regularly grooved and ridged, foveæ large, shallow and finely rugose; *Abdomen* black, smooth, ventral sheath clear, shining, brown; *Wings* of a dusky hue, veins dark red, areolet large, distinct, radial area open, but the second transverse vein extends along the margin of the wing one-third of the length of the area, and *the radial vein is thickened at the margin of the wing and in most specimens throws back a very short branch along the margin of the radial area*, showing a tendency towards a closed radial area. *Legs* a clear dark amber with base of trochanters and middle of femora and tibiæ shining, brown. Length, dry specimens, .11.

Male smaller, 14-jointed antennæ, third joint deeply incised, color of antennæ and legs slightly darker than female. Length, .09.

I have numerous specimens male and female, though the females are far more numerous than the males. This species is remarkably distinct from the three species of N. Am. Diastrophus hitherto described, and in the darker veins and the partially closed radial area from the species described below.

Looking over my collection of galls, I find a gall from the stalk of *Rubus strigosus* and several gall insects reared from the same. The gall is an inch long, and three-fourths of an inch thick—an abrupt swelling involving the whole circumference of the stalk. Quite a large number of insects seem to have escaped from it, though many of them were parasites; I have only five specimens of the true gall-fly, and these are all females. The description is as follows:—

Diastrophus turdigus, N. Sp. Female. *Head* black, shining; *Antennæ* reddish brown, 13-jointed, joints of nearly equal length, but longer, less hairy and less distinctly annulose than in D. radicum. Upper part of the *face* rough, lower with fine grooves, converging to the mouth; *Mesothorax* smooth, black and shining, parapsidal grooves narrow, intermedial lines very short, and only seen in a favorable light. A faint linear depression over the base of the anterior wings. *Scutellum* finely wrinkled, foveæ deep, smooth; *Pleura* finely striate; *Abdomen* black, smooth, but the ventral sheath reddish brown; *Wings* dusky, veins distinct, but not heavy, areolet *very small* and in some individuals obsolete, radial area open—the radial vein stops short of the margin of the wing—cubital vein slender, reaching to the first transverse; second transverse spreads out at the base of the radial area into a dark reddish brown cloud; *Legs* dark amber, changing in the trochanters and middle of the femora and tibiæ, to a clear dark brown. Length, dry specimens, .12. Five females, no males.

I have a male gall-fly, reared from a similar gall, found this spring on the cultivated red raspberry. I could not learn the variety of the raspberry. It would be strange if it should prove an introduced variety, for the fly seems to be identical with D. turgidus ; the only difference I can see, besides the sexual, is that the legs are darker. The antennæ are 14-jointed, the third joint deeply incised.

As I have several galls from this variety of raspberry, and shall probably rear both male and female flies, I shall have an opportunity to compare the females reared from the wild and cultivated raspberry, and shall then be able to decide the question of their identity.

My raspberry galls and also several species of oak galls in my collection, are much pecked by birds. With the countless tribes of parasitic insects, and the birds that prey upon them, it is a wonder the whole family of gall makers does not become extinct.

MISCELLANEOUS NOTES.

Cocoon of the Cecropia.—In the last number of the *Amer. Ent & Bot.*, mention is made of kernels of corn being found in the cocoon of the *Cecropia*. Two similar instances have come under my notice. Twice I have found beech-nuts in the inside of the cocoon at the small end, between the caterpillar and the innermost layer of silk. The explanation offered by Mr. LeBaron seems hardly admissible under these circumstances. On the other hand, the fact of no beech trees being with an eighth of a mile would indicate that they must have been placed there by the blue-jays or some other bird as he supposes.—C. S. Minton, Boston, Mass.

Food Plants of C. Promethea.—The following list is compiled from actual observation and various authorities:—Barberry, birch, cherry, maple, sassafras, azalea, oaks, sometimes arbor vitae and pine, apple, peach, plum, syringa, silver bell, beech.—C. S. Minton, Boston, Mass.

How to Preserve Spiders.—From Thorell's Essays on European Spiders ('Nova Acta regiæ Societatis Scientiarum Upsaliensis,' scr. III. vol. vii. fasc. I, 1869,) we extract the following observations, first suggested by M. Westring, a Swedish naturalist, on the best mode of preserving spiders in Natural History collections. The essential feature of the method is that the spider's *abdomen*, and that part only of its body, is *hardened by heat*. The spider is first killed, either by the vapour of ether or by heat, and is impaled by an insect pin, which is passed through the right side of the cephalo-thorax ; the abdomen is then cut off close to the cephalo-thorax, and the cut surface dried with blotting-paper. The head of another insect pin is cut off, and the blunt

extremity introduced through the incision into the abdomen, up to the spinners. The abdomen thus spitted is inserted into a large test-tube held over the flame of a candle, the preparation being constantly rotated till dry, avoiding the extremes of too much or too little heat—the firmness of the abdomen being tested every now and then with a fine needle, till it is so firm as not to yield to pressure; the front extremity of the pin is now cut off obliquely, and the point thus made inserted into the cephalo-thorax, the two halves of the body being thus again brought into apposition. The animal may then be mounted as usual. This method is stated by Mr. Thorell to preserve the appearance of animals almost entirely unchanged.—*Nature.*

Mummied Beetles.—In the year 1835 the late Professor Audouin exhibited before the (French) Entomological Society a vase of red clay, resembling an orange in size and form, with a short neck, which had been taken from an ancient tomb at Luxor (the Egyptian Thebes). There was a slight fracture where the neck joined the body, and, on examination, the vase was found to be filled with a black lumpy matter, consisting entirely of the bodies of a small ptinoid beetle (Gibbium Scotias). The mass was quite compact, so that the number of beetles must have reached several thousands. How are we to explain the presence of such an enormous quantity of individulas of this species in a vase, into which they could not have themselves penetrated, because, previously to the fracture occurring, it was hermetically sealed? It is a problem which it is not easy to solve. M. Brulle who quotes the story in his "Histoire des Coleopteres," believes without doubt that the circumstance is connected with some superstitious usage of the ancient Egyptians. We leave to archæologists the task of appraising this theory at its proper value, which, if it be well founded, will go far to settle the difficulty.—(*Duponchel, "Dict. d'Hist. Nat."*) *Science Gossip.*

Spiders and Larvæ.—In the April part of *Science Gossip* is a query with the above heading, which I can answer in the affirmative. If Mr. Roberts wishes to see a spider thoroughly puzzled, let him put a leaf-rolling caterpillar into its web; the spider (provided the larva be proportionate to its own size) seizes it fearlessly and winds it up; but as fast as he winds, so fast does the larva slip out of its bonds, until it either escapes from the web altogether or gets weakened by the repeated bites of its adversary. The larva of a *Noctua* also astonishes a spider, from the fact that it cannot be made to lie still in the web, though wrapped in ever so many grave-clothes; when the spider has given it two or three bites, however, its activity decreases, when the spider sucks its juices at pleasure. The larvæ of certain species of *Lepidoptera* and *Hymenoptera* are distasteful to spiders, as I observed in a short paper read before the Entomological Society in March, 1869.—*A. G. Britten, British Museum (Scientific Gossip).*

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(*Continued from page* 86.)

BUPRESTIDEÆ.

CHALCHOPHORA, *Sol.*
*Lacustris, *Lec.*1
Virginiensis, *Drury.*
Campestris, *Say.*
DICERCA, *Esch.*
Divaricata, *Say.*
Lurida, *Fab.*
Spreta, *Lap.*
*Asperata, *Lap.*
Tenebrosa, *Kirby.*
*Chrysea, *Mels.*
*Punctulata, *Schonh.*
*Manca, *Lec.*
ANCYLOCHIRA, *Esch.*
Fasciata, *Fab.*
Maculiventris, *Say.*
Striata, *Fab.*
CINYRA, *Lap.*
*Gracilipes, *Mels.*
MELANOPHILA, *Esch.*
Longipes, *Say.*
Fulvoguttata, *Harris.*
ANTHAXIA, *Esch.*
*Cyanella, *Gory,*
Subaenea, *Lec.*
*Viridifrons, *Say.*
CHRYSOBOTHRIS, *Esch.*
Femorata, *Fab.*
Quadriimpressa, *Lap.*
Dentipes, *Germ.*

AGRILUS, *Sol.*
Arcuatus, *Say.*
Ruficollis, *Fab.*
*Obliquus, *Lec.*
Otiosus, *Say.*
Bilineatus, *Web.*
*Subcinctus, *Gory.*
Plumbeus, *Lec.*
Politus, *Say.*
*Puncticeps, *Lec.*
*Lacustris, *Lec.*
TAPHROCERUS, *Sol.*
Gracilis, *Say.*
BRACHYS, *Sol.*
Ovata, *Weber.*
Terminans, *Fab.*
*Æruginosa, *Gory.*

THROSCIDÆ.

THROSCUS, *Latr.*
Constrictor, *Say.*
*Punctatus, *Bonv.*
DRAPETES, *Redt.*
Extriatus, *Say.*

ELATERIDÆ.

THAROPS, *Lap.*
*Obliquus, *Say.*
EUCNEMIS, *Ahrens.*
Amœnicornis, *Say.*
FORNAX, *Lap.*
*Orchesides, *Newm.*
Cylindricollis, *Say.*
Calceatus, *Say.*

HYLOCHARES, *Latr.*
*Nigricornis, *Say.*
MICRORHAGUS, *Esch.*
*Imperfectus, *Lec.*
*Humeralis, *Lec.*
*Rufiolus, *Lec.*
ADELOCERA, *Latr.*
Impressicollis, *Say.*
Pennata, *Fab.*
Aurorata, *Say.*
Marmorata, *Fab.*
*Maculata, *Lec.*
ALAUS, *Esch.*
Oculatus, *Linn.*
*Myops, *Fab.*
CARDIOPHORUS, *Esch.*
Amictus, *Mels.*
CRYPTOHYPNUS, *Esch.*
Abbreviatus, *Say.*
*Pectoralis, *Say.*2
ELATER, *Linn.*
Nigricollis, *Germ.*
Linteus, *Say.*
*Discoideus, *Germ.*
*Semi-cinctus, *Rand.*
Vitiosus, *Lec.*
Apicatus, *Say.*
Phœnicopterus, *Germ.*
*Xanthomus, *Germ.*
Luctuosus, *Lec.*
Socer, *Lec.*
Impolitus, *Mels.*

*Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

1 A single specimen taken by Dr. Milward.

2 Taken at the margin of the creek.

ELATER, *Linn. (contin.)*
*Manipularis, *Cand.*
Fuscatus, *Mels.*
Pedalis, *Germ.*
Rubricus, *Say.*
Obliquus, *Say.*
Protervus, *Lec.*
DRASTERIUS, *Esch.*
Dorsalis, *Say.*
Amabilis, *Lec.*
MONOCREPIDIUS, *Esch.*
Auritus, *Herbst.*
LUDIUS, *Latr.*
Abruptus, *Say.*
AGRIOTES, *Esch*
Mancus, *Say.*
*Pubescens, *Mels.*
Fucosus, *Lec.*
Stabilis, *Lec.*
DOLOPIUS, *Esch.*
Pauper, *Lec.*

MELANOTUS, *Esch.*
*Cuneatus, *Lec.*
Scrobicollis, *Lec.*
*Castanipes, *Payk.*
Communis, *Gyll.*
*Pertinax, *Say.*
LIMONIUS, *Esch.*
Aurifer, *Lec.*
Confusus, *Lec.*
Plebejus, *Lec.*
*Quercinus, *Say.*
CAMPYLUS, *Fisch.*
Denticornis, *Kirby.*
PITYOBIUS, *Lec.*
*Anguinus, *Lec.*[3]
ATHOUS, *Esch.*
Brightwelli, *Kirby.*
Acanthus, *Say.*
*Maculicollis, *Lec.*
Cucullatus, *Say.*
Scapularis.

SERICOSOMUS, *Esch.*
*Fusiformis, *Lec.*
Silaceus, *Say.*
OXYGONUS, *Lec.*
Obesus, *Say.*
CORYMBITES, *Latr.*
Hamatus, *Say.*
Triundulatus, *Rand.*
*Furcifer, *Lec.*
Hieroglyphicus, *Say.*
Splendens, *Zieg.*
Inflatus, *Say.*
Rotundicollis, *Say.*
Sulcicollis, *Say.*
Cylindriformis, *Herbst.*
Spinosus, *Lec.*
Pyrrhos, *Herbst.*
Falsificus, *Lec.*
*Athoides, *Lec.*
*Tessellatus, *Linn.*
ASAPHES, *Kirby.*
Memnonius, *Herbst.*
Melanopthalmus, *Mels.*

EXCHANGES.

STAPHYLINIDÆ.—I have for some years been engaged upon exotic *Staphylinidæ* and have already a numerous collection of American species of this family of Coleoptera. Desiring to increase it as much as possible I should like to enter into correspondence with a collector in North America for the exchange or purchase of these insects. I would give in exchange either European Coleoptera or exotic Staphylindæ; if necessary I would pay so much a hundred or named specimen, as desired. Having already published descriptions of several new American species, especially from Chili and Mexico, I venture to hope that I may obtain one or more correspondents in North America.—ALFRED FAUVEL, Bibliothecaire, Societe Linneenne de Normandie, 16 Rue d' Auge, Caen, France.

SILK MOTHS.—Eggs of *B. Yami-mai Pernyi*, and of the white variety, free from disease, also of *B. mori*, for rare species of Canadian Lepidoptera.—W. V. ANDREWS, Rooms 17, No. 137 Broadway, New York.

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3 A specimen of this rare insect was taken on the lake shore, July 17th.

COLEOPTERA.—Species desired from Canada, especially the eastern region; can give in exchange Southern and Californian forms, as well as those from the New England States.—P. S. SPRAGUE, 227 Broadway, South Boston, Mass.

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The Canadian Entomologist.

VOL. II. TORONTO, JULY 1, 1870. No. 8.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 93.)

31. AGONUM AFFINE, *Kirby*.—Length of body 4 lines. Locality not stated. A single specimen taken.

Body very black, glossy. Antennæ longer than the prothorax: prothorax of the same width before as behind, so as to appear more square than in the preceding species; its lateral margin at the base is likewise not reflexed, the dorsal channel is slight, and the disk is minutely and transversely wrinkled; the basilar impressions are deep, large and circular; elytra very slightly bronzed; three punctiform impressions, the anterior one adjoining the third furrow, and the two posterior the second, are visible in the usual situation; the four anterior trochanters are of a deep red.

[28] 32. AGONUM ERYTHROPUM, *Kirby*.—Length of body 4¼ lines. Taken in Canada by Dr. Bigsby.

Body glossy, black underneath, above bronzed. Antennæ black, with the scape dusky rufous; prothorax tinted with copper, obcordate, with rounded angles; basilar impressions round and deep; elytra tinted with copper, with three nearly obsolete punctiform impressions in the usual situation; legs dusky rufous; in other respects it resembles *A. seminitidum*.

This species appears to be the American representative of *A. parumpunctatum*. It is, however, larger, more bronzed, the impressions are less distinct and more distant, and the thighs as well as the tibiæ and tarsi are rufous.

[The name of this species is pre-occupied by Dejean's *P. erythropus*; it is placed with a mark of interrogation in Dr. LeConte's list under *Platynus subcordatus*, Lec.]

33. AGONUM CUPRIPENNE, *Say*. Plate I. fig. 4.—Many specimens of this lovely *Agonum* were taken in lat. 54°. It appears to be very common in North America, where it represents *A. sexpunctatum*, the most brilliant

of our European species, but which *A. cupripenne* far exceeds in beauty. [Quite common in Western Canada.]

[29] 34. CALATHUS GREGARIUS, *Say*.—Taken frequently in lat. 54°. [Say, Ent. Works, ii. p. 472. Taken in both Ontario and Quebec.]

35. PLATYDERUS NITIDUS, *Kirby*. Plate I. fig. 5.—Length of body 4 lines. Three specimens, all females, taken in lat. 54°.

Body black, glossy; head triangular; mouth piceous; antennæ rather longer than the prothorax, piceous with the terminating joints paler, scape rufous; prothorax subquadrangular, with the posterior angles rounded, emarginate at the base as well as at the apex, slightly channelled, with a pair of linear basilar impressions on each side, the external one being oblique and the other longitudinal; elytra rather deeply furrowed, with two punctiform impressions in the usual situation; viewed in the sun, the elytra exhibit changeable shades of blue and bronze; forebreast piceous; legs clear, testaceous. [Previously described as *Feronia (Pterostichus) erythropus*, by Dejean.]

[30] 36. ARGUTOR BICOLOR, *Kirby*.—Length of body 3 lines. Taken twice in lat. 54°.

Body glossy, above black, beneath mahogany coloured; antennæ and palpi at the base dark mahogany colour; prothorax longer than wide, rather narrowest at the base, where it is slightly sinuated, anterior angles rounded, without punctures, dorsal channel slight, a deep short basilar furrow on each side; elytra slightly furrowed with impunctured furrows, the seventh from the suture obsolete; in the interstice between the second and third are three punctiform impressions, the anterior one adjoining the latter and the two posterior ones the former.

This species approaches very near to *A. erythropus*, Dejean, but it is smaller, and the posterior angles of the prothorax are not rounded. The under side of the body, the legs and antennæ, are all of the same colour, sometimes a litte darker, at others a little paler. [The genus *Argutor*, Meg. is now included in *Pterostichus*.]

37. ARGUTOR [PTEROSTICHUS] FEMORALIS, *Kirby*.—Length of the body 3½ lines. Taken in lat. 54°.

This species approaches very near to the preceding one, and its place is between that and *A. vernalis*, of which it is the American representative. It differs from *A. bicolor* chiefly in having only the scape of the antennæ and the tibiæ and tarsi of a different colour from the rest of the body, and in having the anterior half of the furrows of the elytra slightly punctured; and from the latter in having the prothorax narrower at the base, with only a single impunctured impression on each side. [We have received a

specimen of this species, taken in the United States, from our friend Mr. F. G. Sanborn, of Boston, Mass.]

[31] 38. ARGUTOR [PTEROSTICHUS] MANDIBULARIS, *Kirby*.—Length of the body 3½ lines. Taken in lat. 54°.

Body glossy, underneath black, above black-bronzed; mandibles, palpi, scape of antennae and legs rufous, or rather pale chestnut; frontal impressions rather wide: prothorax truncato-obcordate, with a basilar furrow on each side and a few punctures at the posterior angles; elytra lightly furrowed, with punctures in the furrows; two punctiform impressions in the usual situation, one a little beyond the middle of the elytrum, adjacent to the second furrow, and the posterior one near the apex adjacent to the third.

Variety B. Black above, with the whole antennae rufous, elytra piceous, perhaps an immature specimen.

39. ARGUTOR [PTEROSTICHUS] BREVICORNIS, *Kirby*. Plate viii. fig. 3.—Length of body 3 lines. Taken in lat. 65°.

This with the preceding species, in the shape of the prothorax, which is obcordate, departs a little from the others. *A. brevicornis* resembles *A. mandibularis* in many respects, but the body is black, as are also the mandibles and palpi; the antennæ of the male are shorter, and those of the female not longer, than the prothorax; one of these organs in the latter sex, in the only ♀ specimen taken, appears to have been affected by some disease, for the two last joints are larger than the preceding ones, so as to form a kind of knob; it is the right-hand antenna that is so circumstanced; the little furrows at the base of the prothorax are wider than in *A. mandibularis*; the elytra of the ♂ have three, and those of the ♀ four, punctiform impressions, all adjacent to the third furrow. The last eight joints of the antennae in this species have less down and shine more than is usual with the ground beetles in general.

[LeConte, in his list, asks whether this species may not be equivalent to *P. fastidiosus*. Mann.]

[32] 40. OMASEUS [PTEROSTICHUS] ORINOMUM, *Leach*.—Length of body 5½ lines. Taken frequently in lat. 54° and 65°.

Body oblong, glossy, black. Head rather ovate, underneath, in some specimens, chestnut, in others black; palpi piceous; prothorax subcordate, rather longer than wide; a deep, punctured, basilar impression on each side; posterior margin slightly sinuate; elytra subacuminate, lightly furrowed with from four to six largish impressions in the second and third furrows, the first usually being in the third and the second on the second furrow, but the others occasionally varying; the natural number of these impressions seems to be five; legs black, with piceous tarsi.

Variety B. Legs chestnut.

C. Tibiæ and tarsi chestnut.

From the number of specimens collected in the expedition, I should conjecture this to be one of the most common of North American insects. It appears, however, not to have been noticed by Say, nor was it amongst those collected by Dr. Bigsby in Canada, or by Dr. MacCulloch and Capt. Hall in Nova Scotia. [According to LeConte an erroneous determination for *P. luczotii*, Dej., a species taken in Ontario and Quebec.]

41. OMASEUS [PTEROSTICHUS] NIGRITA, *Curtis.*—This is *P. caudicalis*, Say (Ent. Works, ii. 480); it has been taken at Ottawa by Mr. Billings.]

[33] 42. OMASEUS [PTEROSTICHUS] PICICORNIS, *Kirby.*—[Previously described as *P. mutus* by Say (Ent. Works, ii. 470); taken in Canada and the United States.]

[34] 43. STEREOCERUS [AMARA] SIMILIS, *Kirby.*—Plate viii. fig. 1.—Length of body 5¼ lines. A pair were taken in lat. 54°.

Body of a piceous-black, glossy. Palpi piceous; antennae chestnut; frontal impressions deep, rather curving; occiput punctured with scattered punctures; prothorax nearly square with curved sides; basilar impressions wide, punctured, deeply bisulcate, with an elevated little ridge between them and the margin; elytra bronzed, furrowed, furrows scarcely punctured; legs pale chestnut. In the ♀ the elytra are not bronzed, the legs are darker, and the terminal joint of the palpi is longer.

[35.] CURTONOTUS [AMARA] CONVEXIUSCULUS, *Stephens.*—Length of body 5¼ lines. Taken in lat. 65°.

Body dark piceous, sometimes a little bronzed. Antennae and palpi rufous; frontal impressions short, connected by a rather deep furrow; prothorax constricted and punctured at the base, depressed on each side; basilar impressions bisulcate; posterior angles acute, recurved; elytra furrowed, furrows punctured; sides of the ventral segments of the abdomen somewhat punctured and wrinkled, those of the mid-breast grossly punctured; legs chestnut.

[LeConte considers this an erroneous determination, and places it, with a mark of interrogation, as a synonym of his *A. laticollis*, stating (Pro. Acad. Nat. Sci., Phil., June, 1855, p. 347,) respecting the latter that it is "found in Nebraska Territory near the Rocky Mountains. Very similar to the European *A. convexiuscula*, but in comparison with that species the thorax is more rounded on the sides, more narrowed behind, and more finely margined."]

45. CURTONOTUS [AMARA] RUFIMANUS, *Kirby.*—Length of body 5 lines. Several taken in lat. 54°.

with a small shining black head and a dirty brown colored body, with a few small brown dots and fine hairs scattered over its surface. Its tenement consists of a dried-up, blackened leaf, portions of which are drawn together so as to make a rude case, the centre part of which, where his highness resides, is lined with silk. It is very fond of going just where you do not want it. It is partial to the blossoms and newly-formed fruit. If you have a new pear or apple fruiting, with a single bunch of blossom on it, which you are anxiously watching, by-and-by you find that several of the blossoms have set,and while you are flattering yourself that they are doing well, along comes this mischief-maker, pitches his tent alongside this very spot, and drawing the young fruit together with silken threads, holds high carnival among them and frustrates your hopes. Another of its tricks is to gnaw a hole into the top of the branch from which your bunch of blossom issues, and, tunnelling it down, cause the whole thing to wither and die. Often it contents itself with damaging the leaves only, and this one does not mind so much, drawing one after another around its small inside case, until it forms quite a belt of withered and blackened leaves.

Hand picking is the only remedy suggested for these, unless you can employ small birds, such as sparrows, in hunting them up for you.

The moth which this caterpillar produces is rather a pretty little thing Its name we are not yet able to give. It measures, when its wings are expanded, about half an inch. Its fore wings are greyish brown, with a shining white, almost silvery band across the middle, widest on the front margin. The hind wings are plain pale blue, and both are prettily fringed with fine brown hairs, those on the hind wings longest. It appears on the wing from the middle of June until the early part of July. It probably lays its eggs on the leaves, and when the young worms appear, which is most likely early in the fall, they make their small inner silken case, and attaching themselves to some part of the tree, remain unobserved, and in this condition probably winter, awaking to new life and energy with the opening spring.

ICHNEUMON IN A SPIDER'S COCOON.

BY WM. COUPER, MONTREAL.

I inclose an ichneumoned spider's cocoon, which I found on the mountain of Montreal early in May last. When I opened the cocoon, the larvæ had a bluish colour and were quite active. It produced about forty specimens of the fly, which I send you, as I have no means at hand of determining the species. There is however a very nice investigation in regard to the economy and *modus operandi* of this little ichneumon. That is, how does it reach the spider's eggs? I cannot detect an ovipositor, and the body of the creature itself is *only about a sixteenth* of an inch long. The eggs were

protected with a dense covering of silk, which interiorly was very hard and difficult to penetrate; still I cannot see any other way by which it could reach the eggs, unless the spider was compelled to retreat from the nest, when it was only partially covered with silk, and that the little ichneumon deposited her eggs amongst the group during the absence of the spider. If such is the case, the habits of the minute ichneumonidae are similar to those of the small parasitic species of *Microgaster*, for the latter always use stratagem, and, like the Dipterous cuckoo-flies, take advantage to deposit their eggs during the absence of the true owner of the nest. I do not know the species of spider to which the cocoon belongs.

NOTICE OF THE SPECIES OF DREPANODES.

BY AUG. R. GROTE, DEMOPOLIS, ALA.

It is easy to distinguish the species of the genus Drepanodes from the other Phalaenidae, by their falcate or acutely produced primaries and their strong casual resemblance, both in size and ornamentation, to the Platypteryginae (Drepana, Platypterix, Dryopteris), a sub-family of Bombycidae. This resemblance, while it has suggested to M. Guenée the generic name, is paralleled in the sub-order in different instances; but is here noteworthy as illustrating the synthetic relation which the great family Bombycidae sustains to the other moths. The nearer affinities of Drepanodes in its family are with Chaerodes.

In the eighth volume of the Annals of the Lyceum of Natural History of New York, will be found figures and descriptions of three species of this genus. Of these I have found D. puber and D. varus in Central Alabama. A fourth, which I here describe, I have from the same locality. This species (D. sesquilinea) I believe to be identical with one of which I have seen many specimens from New York and Massachusetts, but which I cannot at this writing compare. This not improbably will be found in Canada.

Drepanodes sesquilinea, n. sp.

Male. Pale smooth fawn colour, slightly lustrous; irrorations sub-obsolete. Both median lines distinct on the primaries above. The inner roundedly angulated on the disc approximate to the black discal dot. The outer acutely angulated below costa, consisting of a very narrow whitish external line and a deep olivaceous preceding shade. Apices moderately produced. External margin lined with olivaceous. Terminally there are distinct dark clouded spots interspaceally, between the nervules, at the middle of the wing. On the secondaries the external line is distinctly continued. External margin edged with olivaceous and stained centrally with ochreous. Outside of the external line both wings are shaded with

purplish. Beneath a little darker and more irrorate; the external line is visible on both wings and the black discal dots. The long testaceous antennæ are bi-pectinate to the tips. The body parts are paler than the wings. *Expanse* 26 m. m.

The less olivaceous more purely fawn and paler colour of this species, together with the deep and distinct lines above on the primaries, will distinguish it from D. puber, which it resembles in the shape of the fore wings. The squamation is close and a little lustrous.

MISCELLANEOUS NOTES.

Rearing Eggs of Butterflies.—I have been so successful this season in persuading female butterflies to deposit their eggs in captivity, that I think it well to mention the matter in the *Entomologist*. Last season I found it impossible to induce *P. Marcellus* to lay upon leaves or stems of pawpaw that had been cut. This spring I placed a nail-keg, from which the bottom had been knocked out, the top being covered with cloth, over a low pawpaw growing near my house ; and on confining a female Ajax therein, she at once began to deposit her eggs, and continued till the number reached more than twenty. In a few days the young larvæ came out, and with very little trouble I succeeded in raising several of them to the chrysalis state, in which they now are. (I expect to prove by this brood that Marcellus and Ajax are but different broods of the same insect ; a fact I have felt confident of for some years past, but which I could not absolutely establish for want of the link which this experiment will supply). I afterwards treated other females of Ajax in the same manner, and with the same results.

A *C. Philodice*, confined in the same way with growing clover, at once deposited a great number of eggs. So did *Nisoniades Lycidas*, and *N. Pylades*, Scudder, upon Hedysarum. In fact in every instance so far tried, the females have obliged me with as many eggs as I wanted ; and I incline to think this mode of taking eggs will always be successful.—W. H. Edwards, Coalburgh, West Va.

Colorado Potato Beetle.—This most destructive insect (*Doryphora 10-lineata*, Say) has appeared in the western parts of this province, and is already committing great ravages upon the potato plants. We have received specimens both in the larval and imago states from Windsor, county of Essex, and Colinville, county of Lambton, Ont. The most approved remedy for it is to dust the affected plants with a mixture of one part of Paris green and six parts of flour or ashes. Detailed illustrated descriptions of the insect may be found in the *American Entomologist* for November, 1868, and in the forthcoming number of the *Weekly Globe* and *Canada Farmer*.

The Currant-bush Saw-fly.—I have moved this year to a house where there is a garden, in which I have made an unexpected discovery, namely,

that *Nematus ventricosus*, Klug, is found at Quebec. The larvæ have been very destructive, stripping some of the gooseberry and currant bushes almost before I knew they were there.—G. J. BOWLES, Quebec. [This pestilent saw-fly has been more than usually destructive this year in the province of Ontario. It appears now to have spread over the whole Dominion of Canada, as well as over some of the neighbouring States; last year we received specimens from Mr. J. M. Jones, of Halifax, Nova Scotia.—ED.]

AMERICAN BUTTERFLIES AND MOTHS.—(1) Do you know of any work on *American Butterflies and Moths*, published in numbers in cheap form, like Newman's *British Moths and Butterflies*, in which every known specimen is figured and described in caterpillar, chrysalis and perfect state, both male and female? and if not, would not such a work pay? (2) Would it not be a good plan to begin such a work in the CANADIAN ENTOMOLOGIST, taking, say butterflies first, each variety in succession, giving scientific and popular names, with wood-cuts of caterpillar, chrysalis, and full grown insect, one in each number till the work is completed?—J. W. H. ROWLEY, Yarmouth, Nova Scotia. [REPLY by ED. C. E.—(1) There is no such work being published in parts; but Mr. Scudder, of Boston, Mass., has in preparation an elaborate work on the Butterflies of New England, which will include probably all the Canadian species. It is to contain descriptions, with coloured illustrations of the eggs, larvæ, pupæ, imagines and parasites, of all the species found in the New England and neighbouring States and Provinces. It must necessarily be an *expensive* work, though no doubt it will be issued at as cheap a rate as possible. It is rather difficult to say whether such a work as Mr. Rowley contemplates would *pay* in America; if well got up and made interesting and attractive to the ordinary collector it might obtain a large sale, but Entomology has hardly a sufficient number of votaries on this Continent as yet to assure against loss in such an undertaking. As far as a work on the Butterflies alone of North America is concerned, nothing can surpass in beauty and excellence Mr. Edwards' work, now being issued in quarterly parts, but of course it is not a cheap work, each part being $2.50 in U. S. currency, though well worth the money. (2) We should be delighted to carry out such a work in the numbers of the CANADIAN ENTOMOLOGIST, had we sufficient means to pay for the wood-cuts. If any enthusiastic Entomologist will supply the necessary funds, or give us a sufficient guarantee against loss, we shall be only too happy to do all the rest of the work to the best of our ability.]

AMERICAN ASSOCIATION.—The nineteenth meeting of the American Association for the Advancement of Science will be held at Troy, N. Y., commencing on Wednesday, August 17th, 1870. The Local Secretaries are Messrs. B. H. Hall and H. B. Nason, Troy, N. Y.

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 103.)

RHIPICERIDÆ.

*Sandalus niger, *Knoch.*

DASCYLLIDÆ.

*Eurypogon niger, *Motsch.*
Cyphon nebulosus, *Lec.*
modestus, *Lec.*
*ruficollis, *Say.*
fuscipes, *Kirby.*
piceus, *Lec.*
Prionocyphon discoideus, *Say.*
*Helodes pulchella, *Guer.*
*Eucinetus terminalis, *Lec.*

LAMPYRIDÆ.

Dictyoptera perfaceta, *Say.*
Calopteron reticulatum, *Fab.*
*Cænia dimidiata, *Fab.*
*basalis, *Lec.*
Eros coccinatus, *Say.*
mundus, *Say.*
*thoracicus, *Rand.*
sculptilis, *Say.*
*oblitus, *Newm.*
*crenatus, *Germ.*
humeralis, *Fab.*
*modestus, *Say.*
mollis, *Lec.*
canaliculatus, *Say.*
*Calyptocephalus bifarius, *Motsch.*
Lucidota atra, *Fab.*
Photinus corruscus, *Linn.*
nigricans, *Say.*
angulatus, *Say.*
Photinus borealis, *Rand.*
ardens, *Lec.*
marginellus, *Lec.*
*scintillans, *Say.*
Photuris Pensylvanica, *DeGeer.*
*Phengodes plumosa, *Hoff.*
Chauliognathus Pensylvanicus, *DeGeer.*
Podabrus basillaris, *Say.*
*flavicollis, *Lec.*
modestus, *Say.*
diadema, *Fab.*
rugulosus, *Lec.*
*piniphilus, *Esch.*
punctatus, *Kirby.*[1]
*puncticollis, *Kirby.*
*lævicollis, *Kirby.*
pattoni, *Lec.*
Telephorus excavatus, *Lec.*
Carolinus, *Fab.*
angulatus, *Say.*
*lineola, *Fab.*
rectus, *Mels.*
*imbecillis, *Lec.*
*flavipes, *Lec.*
*nigriceps, *Lec.*
fraxini, *Say.*
rotundicollis, *Say.*
tuberculatus, *Lec.*
bilineatus, *Say.*
Silis percomis, *Say.*
*Trypherus latipennis, *Germ.*

* Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

[1] An individual of this species is remarkable for having *three antennæ*. The duplicate, which is placed directly in front of the right antenna, consists of *ten* joints with a *three-jointed branch* from the base of the ninth.

*Malthinus occipitalis, *Lec.*
*Malthodes concavus, *Lec.*
*transversus, *Lec.*

MALACHIDÆ.

Collops 4-maculatus, *Fab.*
vittatus, *Say.*
*Anthocomus flavilabris, *Say.*
*Attalus melanopterus, *Er.*
*morulus, *Lec.*
*Ebæus oblitus, *Lec.*
*Melyris cribratus, *Lec.*

CLERIDÆ.

*Cymatodera bicolor, *Say.*
*Priocera castanea, *Newm.*
Trichodes nuttalli, *Kirby.*
Clerus nigripes, *Say.* (var.)
*nigrifrons, *Say.*
*thoracicus, *Oliv.*
trifasciatus, *Say.*
dubius, *Fab.*
sanguineus, *Say.*
*Hydnocera unifasciata, *Say.*
pallipennis, *Say.*
verticalis, *Say.*
*longicollis, *Zieg.*
*Phyllobænus dislocatus, *Say.*
*Ichnea laticornis, *Say.*[2]
Chariessa pilosa, *Forst.*
onusta, *Say.*
*Orthopleura damicornis, *Fab.*[3]
*Labricobius rubidus, *Lec.*
Corynetes violaceus, *Linn.*

LYMEXILIDÆ.

*Lymexylon sericeum, *Harris.*[4]

CUPESIDÆ.

Cupes capitata, *Fab.*
concolor, *Westw.*

PTINIDÆ.

Ptinus fur, *Linn.*
Eucrada humeralis, *Mels.*
*Ernobius mollis, *Thom.*
*tenuicornis, *Lec.*[5]
*Oligomerus sericeus, *Lec.*
Sitodrepa panicea, *Thom.*[6]
*Trichodesma gibbosum, *Say.*
*Hadrobregmus errans, *Mels.*
*carinatus, *Say.*
linearis, *Lec.*
*Petalium bistriatum, *Say.*
Anobium notatum, *Say.*
*Tripopitys sericeus, *Mels.*
*Xyletinus peltatus, *Harr.*
fucatus, *Lec.*
*Hemiptychus gravis, *Lec.*[7]
*Protheca puberula, *Lec.*
*Cænocara oculata, *Lec.*
Ptilinus ruficornis, *Say.*
*thoracicus, *Lec.*
Endecatomus rugosus, *Rand.*
Bostrichus serricollis, *Germ.*
*truncaticollis, *Lec.*[8]
Lyctus striatus, *Mels.*

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[2] July, on hickory.
[3] July 27th, on hickory.
[4] Under bark of dead oak, in August.
[5] On pine, May 31st.
[6] Drug store, Grimsby, in *Cantharis vesicatoria.*
[7] Bred from woody fungus.
[8] Under bark of black ash stumps; last of July.

LIST OF COLEOPTERA

COLLECTED BY A. S. PACKARD, JUN., AT CARIBOU ISLAND, LABRADOR, STRAITS OF BELLE ISLE.

The Coleoptera here enumerated, and named several years since by Dr. Leconte, were collected by me during the summer of 1860 at Caribou Island while a member of the Williams College expedition to Labrador and Greenland under the direction of Prof. P. A. Chadbourne. This is an incomplete list of the Coleoptera of Labrador; and in a subsequent expedition with my friend, Wm. Bradford, the artist, to Hopedale, Labrador, many more forms, as yet not named, were collected.—A. S. P.

Gyrinus, not determined.
Agabus punctulatus, Aubé.
" *laevidorsus*, Lec.
" *semipunctatus*, Kirby.
" *subfasciatus*, Lec.
" *infuscatus*, Aubé.
Colymbetes sculptilis, Harris.
" *picipes*, Kirby.)
Hydroporus tenebrosus, Lec.
Silpha Lapponica (Linn.)
Creophilus villosus, Grav.
Amara similis, Lec. (*Stereocerus similis*, Kirby).
Amara near *melanogastrica*, Esch., perhaps *brunnipennis*, Dej.
Calathus confusus, Lec.
Bledius, not determined.
Ips sanguinolentus, Oliv.
Byrrhus Americanus, Lec.
" *Kirbyi* (*picipes*, Kirby).
Eanus vagus, Lec. (*Limonius vagus*, Lec.)
" *maculipennis*, Lec., n. sp.
Philhydrus bifidus, Lec.
Podabrus mandibularis (*Acmæops proteus*, Lec., *Lepr. proteus*, Kirby.
Atomaria, not determined.
Criocephalus agrestis, Kirby.
Leptura, n. sp.

BOOKS RECEIVED.

Glimpses of Nature, a Magazine of Natural History in all its branches. Edited by Samuel M. Maxwell. Vol. i. No. 1. Mauch Chunk, Pa., June, 1870.—A new and neatly printed periodical, to which we wish all possible success.

First Annual Report of the American Museum of Natural History. January, 1870. New York.

Notes on Graptas C-aureum *and* interrogationus, *Fab.*; and *Descriptions of new species of Diurnal Lepidoptera found within the United States.* By Wm. H. Edwards. Among the eighteen new species described in the latter paper is one, *Pieris Virginiensis*, that has been taken in London, Ont., by Mr. Saunders.

Proceedings of the Boston Society of Natural History. Vol. xiii. pages 225 to 256.—*Hardwicke's Science Gossip.* Nos. 64 to 67.—*Nature.* Nos. 22 to 33. *Le Naturaliste Canadien*, Vol. ii., Nos. 5. 6. 7.—*The American Naturalist*, Vol iv., Nos. 2 to 5.—*The American Entomologist and Botanist*, Vol. ii., Nos. 6 to 8.—*Petites Nouvelles Entomologiques*—*The Rural New Yorker*—*The Prairie Farmer*—*The American Agriculturist*

—*The Maine Farmer*—*The Bunker Hill Aurora*—*The Weekly N. Y. Sun*—*Arthur's Home Magazine* and *The Children's Hour*—*The Canada Farmer*—*The Journal of Education*, Toronto. Vol. xxiii., Nos. 1 to 5—*Newman's Entomologist*, Nos. 75 to 78 (from Mr. Reeks)—*The Horticulturist*, New York. Nos. 286 to 288.

CHANGE OF ADDRESS.—Mr. Wm. Couper, Naturalist, has removed from *Ottawa, Ont.*, to MONTREAL, P. Q.

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AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P. Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, N. Y.

ENGLAND.—Wm. Wesley, 81 Fleet Street, London, E. C. Subscription 5s. per Vol.

FRANCE.—E. Deyrolle, fils, 19 Rue de la Monnaie, Paris, Subscription 8 francs.

This is extremely similar to the species last described, from which it principally differs in having the legs of the colour of dark pitch, with the exception of the hands or anterior tarsi, which are rufous; the sides of the ventral segments of the abdomen also appear less conspicuously punctured.

[LeConte (*loc. cit.* p. 356) states that this is "probably a variety of *A. laticollis*, Lec., in which case the name will not have preference, as the description must be considered worthless, and moreover must be considered as erroneously separated from *A. convexiuscula*, Kirby." He makes the same remarks also upon the two following species: *C. brevilabris*, Kirby, and *C. latior*, Kirby.]

45. CURTONOTUS BREVILABRIS, *Kirby*.—Length of body 4⅓ lines. A single specimen taken in lat. 65°.

[36.] Like the preceding species, but smaller; the upper lip is blacker, not half so long and slightly emarginate; the elytra are dark, and the legs pale chestnut; the furrows of the former are less conspicuously punctured; the frontal impressions likewise are longer and connected by a slighter furrow.

47. CURTONOTUS LATIOR, *Kirby*.—Length of the body 5 lines. One specimen only taken.

This species has a good deal the aspect of *Bradytus apricarius*, but it is a larger insect and rather wider in proportion, and the bifid intermediate tooth of the lower lip proves that it is a true *Curtonotus*. Body piceous, above bronzed. Upper lip, palpi, antennae, side-covers, and legs, all rufous; nose at the anterior margin has an obtuse-angular sinus; frontal impressions punctiform, connected by a slightly-drawn line or furrow; prothorax wider than long, the lateral margins forming a segment of a circle without any posterior constriction; at the base the prothorax is depressed, the basilar impressions are bisulcate, the inner furrow being the longest; furrows of the elytra punctured.

48. PŒCILUS [PTEROSTICHUS] LUCUBLANDUS, *Say*.—Many specimens taken in lat. 54°. [Excessively common in Canada; for description *vide* Say's Ent. Works, ii. 478.]

[37] 49. PŒCILUS [PTEROSTICHUS] CASTANIPES, *Kirby*.—Length of body 5½ lines. One specimen only taken.

This species differs from variety D. of *P. lucublandus* ("entirely black, with the sides of the prothorax impunctured, elytra violet"), which it much resembles, it being entirely black; in having slighter basilar impressions, less distinctly punctured; it has likewise only three punctiform impressions on the elytra, the granular reticulations of the substance of which

are also more easily discovered. [Considered to be merely a variety of *P. lucublandus* by LeConte.]

50. PŒCILUS [PTEROSTICHUS] CHALCITES, *Say*.—Only a single specimen taken.

[Not uncommon in Canada; for description *vide* Say's Ent. Works, ii. 479.]

ON THE ECONOMY OF A SPECIES OF FEONUS.

BY WM. COUPER, MONTREAL.

On the 8th of January last, while searching for hybernating Coleoptera in the woods near Ottawa, I had occasion to strip the bark of a decayed ash tree, under which, among other insect store, I found a small transparent and curiously formed cocoon containing a larva of a fly which was at that time unknown to me. The cocoon was imbedded in the bark, occupying what I am now led to believe the excavation made by a grub of *Cerambyx*, or some other Coleopterous bark-borer. When cocoons belonging to the genera EVANIIDÆ or ICHNEUMONIDÆ are found under bark of trees, or stones imbedded in the earth, we may safely assume that they are accompanied by parasites, and that the original possessor has been devoured because it was just the food that suited them. Thus it is not difficult to trace the economy of many species of the above named genera; but as I am not certain that either cocoon or insect were hitherto described, I have taken the trouble to send you the following: The shape of the cocoon is oblong, surrounded by a band, and covered by a thin pellucid lid, and the form resembles a small coffin. The head of the insect was placed at the small end, and the space in front of it is packed with minute particles of dust, evidently produced from the bark by the original occupier. Length of cocoon 3/8 inch.

Feonus Arca, n. sp.—Head black, glossy, impunctured; eyes black, round; antennæ black, two-eighths of an inch long; thorax not so black as head; the sides beneath and between the wings dark chestnut, interspersed with short fulvous hairs; wings fuliginous; nervures and stigma black; legs black, hairy; base of the femora fulvous; abdomen bright red, with scattered fulvous hairs; ovipositor black, as long as antennæ. Length 3/8 inch.

I have another cocoon of the same form in my collection, but the work of a larger species, being half an inch long. It therefore behoves that persons who wish to study the economy of these useful insects, should search for them early in autumn, when they will be discovered either destroying the larva or forming the cocoon in which they rest during the winter.

ENTOMOLOGICAL GLEANINGS.

BY W. SAUNDERS, LONDON, ONT.

With a fruit farm in the country frequently visited, and a fruit garden in town, my opportunities for observing the times and doings of insect foes and friends are sufficiently ample to satisfiy the desires of the most active and enthusiastic "bug-hunter" that ever carried a net. Now a swarm of caterpillars disfigures the form and mars the beauty of a handsome tree, by consuming a considerable part of its foliage; again a host of aphides, by their constant sucking of the juices of the leaves, will cause them to shrivel, curl up, and often change color, and the enormons rate at which these creatures increase adds much to the difficulty of their extermination; or some unwelcome "little Turk" sits down uninvited to feed on our finest fruits, and, not satisfied with appeasing its own appetite, leaves its progeny behind to complete the work of destruction; or it may be some rascally borer insidiously undermines one's fondest hopes by girdling and thus destroying trees or shrubs whose growth has cost years of toil and watching. With the desire of helping fellow fruit-growers and others to a better acquaintance with these expensive insect guests, I purpose in this, and probably some subsequent papers, to record observations made from time to time as the season advances.

On the 6th of May the first foe was met. A lot of dwarf pear trees arrested attention from the backwardness of some as compared with others, the unequal way in which the leaves were expanding, and the dark color, almost black, of some of the buds and younger leaves. No caterpillars were to be seen, but on jarring the trees down came the enemy to the ground in considerable numbers, partly falling, partly flying. It proved to be a small bug, belonging to the true bug family, *Hemiptera*, and a species named *Phytocoris (Capsus) linearis.* I never remember having seen this creature doing damage before, so a careful examination of its work was made. Our foe "linearis" is not a "big bug;" it does not measure more than one-fifth of an inch. It is rather variable in color, from dull dark brown to greenish brown, or sometimes dirty yellowish brown. The males are usually darker than the females. The head is yellowish and has three narrow reddish stripes. The beak or sucker is about one-third the length of the body, and when not in use is folded under the breast. The thorax has a yellow margin and several yellowish lines running lengthwise. Behind the thorax is a yellow V-like mark, sometimes more or less imperfect, but usually sufficiently clear to help one to a ready recognition of the species. The wings are a dusky brown, and the legs of a dull, dirty yellow.

This enemy ensconces himself within the young leaves of the just open-

ing buds, puncturing them about their base and along the edges, and extracting their juices with its beak. The result was to disfigure and sometimes entirely destroy the young leaves, causing them to blacken and shrivel up. They were also somewhat partial to the unopened buds, piercing them from the outside and sucking them nearly dry, when they also withered and blackened. Sometimes a whole branch would be thus affected, becoming first stunted, then withered, next dead. Dr. Harris, in his "Insects Injurious to Vegetation," mentions this bug as occurring in Vermont in large numbers in 1851, attacking almost every green thing and doing a great amount of damage throughout the summer. In our own case they disappeared in about a fortnight, but left the trees in a very dilapidated state. Press of other work prevented any remedies being used. Probably a solution of soft soap or dry unslacked lime would have lessened their numbers.

On the 10th of May I was astonished to see the young larva of the gooseberry saw-fly, *Nematus ventricosus*, commencing its depredations on the freshly expanded leaves. This was nearly a month earlier than its usual time of appearing, the leaves having expanded about three weeks earlier than usual. On examining the under side of the leaves rows of white eggs were found in abundance in different stages of development. Those newly deposited were very much smaller than the others, and appeared to be but *slightly* attached to the surface, not let into a slit made in the leaf by the saw of the female, as is commonly supposed; at least I could find no traces of such an operation, although I examined them carefully with a microscope. The gooseberries were now in full bloom. In the second volume of the CANADIAN ENTOMOLOGIST, p. 16, and also at p. 48, an opinion is expressed that a cocoon of this insect found freshly made on the 29th of May was the work of a larva which had wintered over. The observations made this spring do not in any way upset this idea, for the earliness of the season will account for the apparent discrepancy. They will certainly prove very troublesome this season, they are so very abundant, and now, at the last of the month, when many of the full-grown larvæ have gone into chrysalis, freshly-laid eggs or larvæ just hatched may be found on almost every bush. Remedy—patience and plenty of hellebore, an ounce or two to the pailful, and shower lightly on the bushes with a watering pot.

There is a small caterpillar, a leaf-roller or case-maker, which is very troublesome. It probably passes the winter in the caterpillar state, for almost as soon as the buds begin to burst it begins its mischievous operations, and when first observed is not usually more than half grown. It is a very small thing even when full grown, being then half an inch in length,

The Canadian Entomologist.

VOL. II. TORONTO, AUGUST 31, 1870. No. 9.

APOLOGETIC.

The Editor begs that the readers of the CANADIAN ENTOMOLOGIST will accept his apologies for the delay that has taken place in the issue of the present number. Since the date of the last number, he has made a complete change of occupation and residence, and his time has been so much encroached upon in consequence that it has been quite impossible for him to superintend the publication of this number until the present late date. For some years past he has been in charge of a large rural parish, the manifold duties of which gradually increased to such an extent as to leave him very little leisure for Entomological work; recently, however, he was offered, and, after some consideration, accepted the Head Mastership of the Trinity College School at Port Hope—a preparatory institution to the Church of England University at Toronto. During the last few weeks his time, as can readily be imagined, has been entirely engrossed with the arrangement of matters in his late parish, and the toil and trouble of removal. He has ventured to make this personal explanation in order that the reader may understand and excuse the long delay incurred in the issue of this number—a delay which, he trusts, will not soon recur.

His address is now: "THE REV. C. J. S. BETHUNE, *Trinity College School, Port Hope, Ont.*" Exchanges will please address: "CANADIAN ENTOMOLOGIST, *Port Hope, Ont.*"

ACCENTUATED LIST OF CANADIAN LEPIDOPTERA,

BY E. B. REED, LONDON, ONTARIO.

This List is compiled on the same principle as the Oxford and Cambridge Accentuated List of British Lepidoptera, of which valuable little book we have made free use. A quotation from its preface well explains our object:

"The want of uniformity in the pronunciation of scientific names, and the consequent difficulty of communication between the less educated, but often more practical men of science, is an admitted evil. To afford a remedy so far as Lepidopterology is concerned, and for the especial use and benefit of those to whom circumstances have denied the advantage of

a classical education, while their inborn love of Natural History has led them to the study of this order of insects," we have published this accentuated list of Canadian Lepidoptera.

RULES FOR PRONUNCIATION.

Every vowel is to be *pronounced* short unless marked long, thus ē.

TABLE OF VOWEL SOUNDS.

a	is to be pronounced as in the word			"hat."	*ā*	as in	"hate."
e	"	"	"	"met."	*ē*	"	"mete."
i	"	"	"	"hid."	*ī*	"	"hide."
o	"	"	"	"hop."	*ō*	"	"hope."
u	"	"	"	"duck."	*ū*	"	"duke."

Two vowels occurring together, and not joined as in the diphthongs, are to be pronounced as two syllables; thus, *Regiella* pron. *Re-gi-el-la*, not *Re-giel-la*.

TABLE OF CONSONANT SOUNDS.

c is to be pronounced hard, as *k*.
ç " " soft, as *s*.
ch " " hard, as *k*, except where preceded by *s*, in which case the "*sch*" is equivalent to *sh*, and is printed *sçh*: thus, *Frisçhella*, pron. as *Frishella*.
g is to be pronounced hard, as in "gate."
g " " soft, " "gem."

The position of the accent (') shows where stress is to be laid: viz., on the syllable *preceding the accent*.

LEPIDOPTERA—*Lepidop'tera*. Gr. *Lepis* a scale, *pteron* a wing. Insects whose wings are clothed with scales.

DIURNI—*Diur'ni*. Day-fliers.

RHOPALOCERA—*Rhopaloc'era*. Gr. *Rhopalon* a club, *keras* a horn. Insects whose antennæ are clubbed at the extremity. All butterflies have this peculiarity.

PAPILIONIDÆ—*Papiliō'nidæ*—the family of which the genus Papilio is the type.

PAPILIO—*Pāpilio*, a butterfly. Linnæus first attempted to combine in some degree Natural and Civil History, by attaching the names of personages illustrious in their day to insects of particular kinds. His first divison of the Butterflies consists of *Equites* (Knights), and these are sub-divided into *Troes* and *Achivi* (Trojans and Greeks).

TURNUS—*Tur'nus*. A prince of the Rutuli, who contended with Ænēas for the princess Lavinia.

TROILUS—*Trō'ilus*. A son of Priam and Hecuba killed by Achilles.

PHILENOR—*Philē'nor*. A Grecian proper name.

ASTERIAS—*Aste'rias*. Daughter of Cæus and Phœbe, and sister of Latōna.

THOAS—*Tho'as*. King of Chersonēsus to whom Iphigenīa was brought.

AJAX—*Ajax*. A Grecian hero, son of Telamon.

PIERIDÆ—*Pieridæ*. The family of which the genus Pieris is the type.

PIERIS—*Pi'eris*, a Muse. The Muses derived their name Pierides from Mount Pierus, where they were worshipped.

PROTODICE—*Prōto'dice.* Gr. "Protos" first, "Dice" the name of one of the hours—in allusion probably to this insect being one of the earliest to appear in Spring.

RAPÆ—*Rāpæ.* Feeds on Rape. (Brassica Rāpæ).

OLERACEA—*Olerā'cea.* Feeds on Cabbage (Brassica Olerācea).

COLIAS—*Cōlias.* A surname af Venus from a promontory in Attica where she was worshipped.

NOTES ON SOME OF THE COMMON SPECIES OF CARABIDÆ, FOUND IN TEMPERATE NORTH AMERICA.

BY PHILIP S. SPRAGUE.

ARTICLE NO. IV.

Harpalus (Carabus) *pensylvanicus*, Degeer. Mem. Ins. IV. 108. Reddish brown; head dusky; shells striate; body beneath, antennæ and feet testaceous. Inhab. Penn. N. A. Tast. p. 104, t. IV. f. 22, Degeer.

H. (C.) *pensylvanicus.* Winged; body above black; beneath ferruginous. M. A. Fab. Syst. Elut. I. 195.

H. (C.) *pensylvanicus.* Resembles *ruficornis.* Head black; thorax almost square, with a longitudinal line impressed in the middle and two posterior impressions; elytra black, striated; body beneath brown, more or less clear. Oliv. III. 57, t. XI. f. 92 b.

H. bicolor, Say. Head black; mouth and antennæ rufo-testaceous'; gula piceous; thorax glabrous on the disk; a dorsal impressed line; area of hind angles impressed and confluently punctured; posterior angles rounded; elytra striate; striæ impunctured; margin with numerous punctures; pectus and post-pectus piceous-black; piceous on the disk, with obsolete punctures; feet testaceous pale; venter piceous-black; tail paler. Trans. Amer. Philo. Soci. II. 26.

H. faunus, Dej., and *flavipes*, Dej., Cat. 3rd ed. p. 15. Oblong oval; above black; thorax nearly square; on both sides behind punctured; basal foveæ distinct; posterior angles nearly right; elytra striate; sides obsoletely punctured; behind obliquely sinuate; antennæ and feet testaceous. Dej. Sp. IV. 254. The foregoing descriptions are supposed by Dr. LeConte to refer to one and the same species described by Degeer as *Carabus pensylvanicus*, and this decision is now acquiesced in by other entomologists. This example of the lack, of minute and systematic description is only one of the many; in fact it is the rule, as you will see by the many synonyms attached to other species and is the great difficulty all students experience in determining them.

Harpalus pensylvanicus, Dej., N. A. Long. .55 in. (45–65). Broad oblong oval, above usually dull black; sub-Alpine and northern varieties blacker and more shining; legs, antennæ and mouth testaceous yellow; thorax one-fourth broader than long, scarcely narrowed behind the middle; sides broadly rounded and strongly depressed; the margin is quite narrow

at the apex, widening posteriorly, and absorbing the whole bassal foveæ, making a broad flattened space internally from the apex of the basal angle; basal foveæ strongly marked, and with the margin heavily and confluently punctured; basal angles obtuse, somewhat rounded; elytral striæ deep; interstices convex, and at the sides punctured, in some specimens confluently; no dorsal puncture; mentum distinctly toothed. The broadly rounded sides, the wide and punctured margin of the thorax, with the side punctures of the elytra, are the special parts that differ from the following species, to which it is most nearly allied.

Harpalus compar, Lec.—Mass. to Cal. Long. .55 in. Oblong oval; above reddish black, somewhat shining; beneath lighter; legs, antennæ and mouth reddish yellow; thorax one-fourth broader than long; strongly but narrowly depressed at sides; distinctly narrowed behind; basal foveæ shallow, confluently punctured in centre; basal angles obtuse, scarcely rounded; flattened above, and with the side margin finely punctured; elytral striæ well marked, not deep, with the interstices flattened, and with a few obsolete punctures at the sides; no dorsal puncture; mentum tooth distinct. This species differs from *H. pensylvanicus* by the thorax being distinctly narrowed behind the middle instead of broadly rounded; the depressed margin is narrower; not so broad and flattened at the basal angle, yet somewhat depressed; the punctures are finer and not confluent except in basal foveæ; the apex of basal angle is quite well defined; the interstices of elytra are flat; the punctures at the sides nearly obsolete; sometimes only a few points are seen on the seventh and ninth interstices. This beetle was described quite a number of times by our early entomologists under different names, which being pre-occupied necessitated a new one, which was given by Dr. LeConte.

Harpalus erythropus, Dej. Oblong oval; above black; thorax nearly square; punctured on both sides behind; basal foveæ shallow; posterior angles nearly right; elytra striate; behind obliquely sinuate; antennæ and feet reddish-yellow. Long. 5½ lines. Penn. This beetle much resembles *faunus* (see under the head of *H. pensylvanicus*), but is a little smaller; it is very nearly of the same color; the thorax is less rounded at the sides; sides not depressed; basal foveæ less marked; elytra nearly of the same form; interstices smooth, not punctured at the sides; palpi, antennæ and feet reddish-yellow. N. A., Dej. Sp. IV. 258. The above is a translation of the original description of DeJean. My description of *H. compar* will answer for this species, with the following differences: it is much smaller; long .44-50 in.; the sides of the thorax are perhaps more distinctly narrowed; the punctures of basal foveæ and sides a very little deeper, and without punctures at sides of elytra. Were a large *erythropus* and a small *compar* placed side by side, the only real difference would be the punctures at the sides of elytra. These two species run so close together as to make it doubtful if they are distinct. The three species just described, with an intermediate one, *H. longicollis*, Lec., which I will leave for a

future time, have puzzled carabæan entomologists from the first describers to the present time, and I fear that until we have some additional way of determining species we shall still continue in doubt. With quite a large series coming from Texas to Oregon and from Canada to Florida, I am at a loss where to place some examples, they so strongly partake of what we consider two distinct species. The preceding descriptions are typical forms which will absorb the mass of all captures.

Since Article No. 2 was written, I have received from Missouri *Harpalus testaceus*, Lec. (See page 59, Vol. 2.) Oblong oval; reddish-yellow, shining; thorax more than one-half shorter than broad; posterior angles right, quite prominent, with the base on both sides shortly impressed; elytra at apex scarcely sinuate; striæ obsoletely punctured; interstices a little convex, with a single puncture on the third.—Trans. Phil. Philo. Soci. X. 385. In addition to the above, which is Dr. LeConte's description translated, I will describe the specimen in my cabinet. Long. .39 inch; uniformly light testaceous; thorax nearly twice broader than long; narrow and sinuated at the sides behind the middle; strongly and broadly depressed; basal angles obtuse; apex prominent; basal foveæ are impressed points; elytral striæ deep; interstices convex; no dorsal puncture; body beneath has accessory ambulatorial setæ. Dr. LeConte says, Pro. Acad. Nat. Sci. 1855, p. 101, "elytra without dorsal puncture." With the above corrections this beetle will be readily recognized.

Harpalus faunus, Say.—Long. .42–55 in.; oblong oval; reddish black, shining, lighter beneath; thorax nearly square, margins lighter, clear; sides sub-parallel, strongly depressed; basal foveæ broad, deep, and with the margin well punctured; basal angle right, apex slightly rounded; elytral striæ deep; interstices convex, not punctured; ♀ has a row on the seventh, and sometimes also on the ninth, which, with the square thorax, and light margins, makes this a well-marked species.

A Monthly journal has been started in Jena devoted to the interest of Sericiculture.

Illinois State Entomologist.—We learn that Dr. Wm. LeBaron, of Geneva, Kane county, Ills., has been appointed to the office of the State Entomologist, made vacant by the death of our late associate. Well done, Governor Palmer! Our Illinois friends have good cause to rejoice at the appointment!—*Amer. Entomologist.*

ENTOMOLOGICAL GLEANINGS.

PAPER NO. 2.

BY W. SAUNDERS, LONDON, ONT.

Phytocoris linearis (Capsus oblineatus, Say.)

I regret that I had not observed before writing paper No. 1, a valuable article by my esteemed friend Riley on this insect, in his last Annual Report on the insects of Missouri. He there speaks of effects produced by it on young pear trees in that section, precisely similar to those I described and expresses the opinion, which I also entertain, that the puncture of this insect is peculiarly poisonous to the young growth on the tree. He says, "it attacks many kinds of herbaceous plants, such as dahlias, asters, marigolds, balsams, cabbages, potatoes, turnips," &c., and several other trees, besides pear, viz., quince, apple, plum and cherry. They deposit their eggs and breed on the plants, and the young and old bugs together may be noticed through most of the summer months. The young bugs are perfectly green, but in other respects do not differ from their parents except in lacking wings. There are probably two broods during the season. I have observed the full grown bugs throughout the summer, but more abundant early in August; I noticed them very numerous about some swollen diseased ears of corn, resulting from that peculiar black fungoid growth to which it is at times subject. Mr. Riley suggests as remedies strong tobacco water, quassia water, vinegar and cresylic soap.

Affecting the apple, Phycita nebulo, Walsh.

While looking over some apple trees, on the 23rd of May, I observed the work of a small case-making larva, which I had never noticed before. Its case resembled a long miniature horn, wide at one end, tapering almost to a point at the other, and frequently twisted in a very odd manner. There were generally portions of dead leaves fastened around the case, so as to partially conceal it, and a firm base of attachment was made for it by gnawing off the young bark from the twig on which it rested, and then firmly glueing it with some glutinous secretion to the spot thus laid bare. The case was curiously constructed of silk interwoven very cleverly with the excrement of the artificer, and had a smooth whitish surface internally, with an exterior also smooth, but of a yellowish brown color.

The larva lives inside this curious structure, coming out only when it wants food, and quickly retreating when danger threatens. Its length when full grown is about six-tenths of an inch, with a body tapering slightly towards the hinder extremity. Its head is medium sized, rather flat, dark reddish brown with a dull roughened surface, mandibles or jaws dark shining brown.

The body above is a dark dull brown with a slight greenish tint, the second segment being nearly covered above with a horny looking plate, similar in appearance to the head, but a little paler, and edged behind and at the sides with a darker shade—on each side below this plate is a flattened blackish prominence—on each side of third segment is also placed a small shining black tubercle. On each segment from the third to terminal inclusive, are several very minute blackish dots, from each one of which arises a single pale brown hair.

The under surface is a little paler than the upper, with a more decided greenish tint, feet green banded and tipped with brownish black, prolegs dull greenish brown.

It changes to a chrysalis sometimes, and I think usually within the case. I found them thus changed in some cases on the trees, but one or two of the specimens among those brought home and fed, came out of the case and changed to a pupa on the outside. The chrysalis was about four-tenths of an inch long, and of a reddish brown colour; one specimen was observed to effect its change on the 8th of June, and produced the winged moth on the 21st of the same month, showing the duration of the pupa stage to be about thirteen days.

On examination the moth proved to be the *Phycita nebulo*, (Walsh) to which he has given the significant common name of "The Rascal Leaf Crumpler." In Mr. Walsh's excellent Report on the noxious insects of Illinois, he states that this larva affects the plum and wild crab as well as the cultivated apple. The young larvæ appear late in the summer, and construct their little cases, surrounded with portions of dried leaves, in which they pass the winter in a torpid state, awaking to activity and resuming their depredations as soon as the young foliage expands in spring. He was of opinion that this insect was confined exclusively to the North Western States. Its occurrence in Canada shows that in this his views were incorrect. Although he had bred a number of specimens, he had never found them preyed on by any species of ichneumon fly, whereas in my case, although I only bred seven or eight, one of them produced an interesting ichneumon, the name of which has not yet been determined.

The moth is a pretty little thing, its wings measure, when expanded, about seven-tenths of an inch. Its fore wings are pale brown, with patches and streaks of silvery white; the hind wings are plain brownish white; the under side of both wings is pale whitish brown; the hind wings paler than the fore wings. It is figured and described by Mr. Walsh, in the Proceedings of the Boston Society of Natural History, vol. 9 p. 312–3.

The amount of damage done by this insect in my own case was not great; their numbers were not sufficient to cause much alarm, but when they are very numerous, one can easily imagine, that their destructive

powers would be very considerable, for besides consuming the foliage, their pernicious habit of gnawing away all the young bark from and about the spot to which the case is attached, would in all probability lead sometimes to the girdling of the young branches, and their consequent death. The little bunch of dead and dried leaves around their cases gives a ready means of detecting the presence of these little rascals, and no better remedy for them than hunting them up, and crushing the case with the hand, has yet been suggested.

From the Grape, Cidaria diversilineata.

Just as the grape blossoms were fully open, and while pinching in the rapidly growing branches of a seedling vine, a blossom bunch attracted attention by its unusual appearance. A closer inspection showed that parts of the bunch had been eaten away, and the remaining portions drawn together by light silken threads, and within the enclosure was a dull brown caterpillar, with its body much contracted, and just ready to assume the chrysalis state. The bunch was removed from the vine and enclosed in a small box, when in a day or two the change of form took place. The chrysalis was six-tenths of an inch long, and of a pale reddish brown color. In about ten days afterwards, it produced the perfect insect which proved to be Cidaria diversilineata. These observations disclose an interesting fact, regarding the history of this insect, that is, that it passes the winter occasionally, if not invariably, in the caterpillar state, hybernating in some secure retreat, where it sleeps peacefully, till called into activity again by the genial warmth of spring, when in a few days it finishes its growth, and effects its changes as already described.

This moth measures when its wings are expanded 1½ inches. Its color is pale ochre yellow, crossed by many greyish brown lines, and clouded also with patches of the same, particularly along the margin of the wings. The under side is a little paler than the upper, with fewer and fainter lines, but bordered along the outer edges, much the same as the above. The body and legs are similar in color to the wings, the legs being marked with black about the joints.

On the 7th of June, a number of reddish geometric caterpillars, were found on the vine leaves, in which they had eaten innumerable holes of various shapes and sizes; these proved to belong to the same insect. At this time they were about an inch long. The head was rather small, flattened in front and bilobed, each lobe projecting above and terminating in a point; color dull brownish green; mandibles tipped with reddish brown.

The body above was dull yellowish green, with a reddish or pink tinge, second segment pale yellowish green, smooth and very similar in appearance to the head, but larger, 3rd, 4th, 11th, 12th and 13th seg-

ments, pale yellowish green, all the middle segments have a decided pinkish tinge, surface of body wrinkled. Terminal segment with two short greenish spines extending backwards over the anal lid.

The under surface was similar in color to the upper, with a double whitish line down the middle ; feet pinkish ; prolegs green.

Many variations in color were observed in different specimens of this larva. One which answered the descriptions given above on the 7th, changed its skin on the morning of the 8th, and appeared in a garb of very dark brown, nearly black, with longitudinal lines of paler brown. A younger specimen was yellowish green, with the head very large and prominent. Another older one was bright, deep red above, with a wide, broken band of dull green down the middle of under surface, without any appearance of the double whitish line so prominent in most of the others. A fourth, about the same size, was dull whitish green, with the whitish lines below also wanting.

A full grown caterpillar found on the 10th of June, measured one and a-quarter inches. Its head was dull reddish brown, the body above yellowish green as in former description, but with a few very small whitish dots on each segment. On each side of the 2nd segment was a small reddish spot, and on the third a larger one of a darker shade ; on this latter segment the folds of the skin protrude, making the spot appear like a brown prominence. The spaces between the middle segments were yellowish, while two or three of the terminal rings were dull brown, in other respects it answered to the previous description. The under surface had a reddish hue, a central dull reddish line, bordered on each side with a faint whitish stripe, edged again without by dull red ; feet reddish, with the space between them yellowish green ; prolegs reddish brown ; spaces between bluish green. June 11th. This larvæ had now fastened itself up in a leaf, preparing for its next change.

I have taken fresh-looking specimens of this moth again on the wing during the middle part of the present month, August. They will probably deposit their eggs late in the month, producing larvæ which will attain to nearly the full growth before winter, and hybernating during the cold season, resume their destructive labors with the opening spring.

As a remedy when their numbers are great, syringing the vines with hellebore and water would probably serve a good purpose. They are not confined to the vine, but are found also on the Virginia creeper, *Ampelopsis quinquefolia.*

NOTES ON THE LARVA OF OPHIUSA BISTRIARIS, *Hübner.*

BY W. SAUNDERS, LONDON.

Late in July a number of specimens of a larva apparently allied to the genus Catocala were taken from the silver maple (*Acer dasycarpum*, Ehrn.) The description of this larva is as follows:

Length 1.40 inches; somewhat onisciform.

Head medium sized, flattened, bilobed; color pale ashen grey, with streaks of pale brown appearing under a magnifying lens as a fine network; a dark brown, nearly black, stripe on each side, and a few short grey hairs scattered over its surface.

Body above brownish-grey, with numerous streaks and dots of pale brown. A double irregular dorsal line, widening here and there throughout its entire length. There are many other broken lines of the same character, composed chiefly of dots, but none of them continuous. A sub-dorsal row of whitish dots, composed of two or three on each of the middle segments, less numerous on anterior segments; a few pale grey hairs placed chiefly along each side below spiracles. On the hinder part of 12th segment is a raised crescent-shaped line edged behind with black, and on the terminal one two whitish dots with a small patch of black at their base. Spiracles pale, oval, edged with black.

Under surface paler and greenish; quite bluish-green from seventh to eleventh segments, with a round central blackish spot on hinder part of seventh and eighth. Anterior pair of prolegs present but dwarfed, and not used in progression; body slightly arched with each forward movement. Feet greenish, semi-transparent; prolegs bluish green dotted with brown.

This larva is subject to considerable variation in its color and markings.

Var. A.—Body paler in color. Head pale, with lines very much less distinct. The black edging of raised line on 12th segment scarcely apparent.

Var. B.—Body dark-red, with markings similar to those of the usual grey variety.

Var. C.—Body dark-brown, nearly black. Head larger, with markings prominent.

When about to go into chrysalis this larva cuts through a portion of a leaf of the tree on which it has fed, and turning it over constructs a snug little case, fastening it up closely and carefully with silken threads, and in this completes its transformations. After remaining in the pupa state about two weeks the imago appeared, which proved to be *Ophiusa bistriaris.*

LIST OF COLEOPTERA.

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 118.)

SPHINDIDÆ.

*Sphindus Americanus, *Lec.*

CIOIDÆ.

*Cis fuscipes, *Mellie.*
*Ennearthron mellyi, *Mell.*
*Ceracis militaris, *Mell.*

TENEBRIONIDÆ.

Phellopsis obcordata, *Lec.*
Blapstinus metallicus, *Lec.*
Centronopus calcaratus, *Fab.*
*Merinus lævis, *Oliv.*
Xylopinus saperdoides, *Oliv.*
Haplandus femoratus, *Fab.*
*concolor, *Lec.*
Nyctobates Pensylvanica, *De Geer.*
*Iphthinus opacus, *Lec.*
Tenebrio molitor, *Linn.*
castaneus, *Knoch.*
tenebrioides, *Beauv.*
Paratenetus punctatus, *Spin.*
*Tribolium madens, *Charp.*
Uloma impressa, *Mels.*
*culinaris, *Linn.*
*mentalis, *Horn.*
Boletotherus cornutus, *Fab.*
Boletophagus corticola, *Say.*
*Rhipidandrus flabellicornis, *Lec.*
*Pentayhyllus pallidus, *Lec.*
Diaperis hydni, *Fab.*
Haplocephala bicornis, *Oliv.*
Platydema excavatum, *Dej.*
Americanum, *Lap.*
*picilabrum, *Mels.*
flavipes, *Fab.*
Hypophloeus parallelus, *Mels.*
*thoracicus, *Mels.*[1]
*Dicœdus punctatus, *Lec.*
Helops micans, *Fab.*
Meracantha contracta, *Beauv.*
*Strongylium tenuicolle, *Say.*

CISTELIDÆ.

Allecula nigrans, *Mels.*
*Hymenorus obscurus, *Say.*
niger, *Mels.*
Cistela brevis, *Say.*
sericea, *Say.*
Isomira quadristriata, *Couper.*
*velutina, *Lec.*
*Mycetocharis foveatus, *Lec.*
*tenuis, *Lec.*
binotata, *Say.*
*Chromatia amœna, *Say.*
Capnochroa fuliginosa, *Mels.*
Androchirus luteipes, *Lec.*

LAGRIIDÆ.

Arthromacra, aenea, *Say.*

PYROCHROIDÆ.

Pyrochroa flabellata, *Fab.*
femoralis, *Lec.*
Schizotus cervicalis, *Newm.*
Dendroides concolor, *Newm.*
Canadensis, *Latr.*

ANTHICIDÆ.

*Corphyra collaris, *Say.*
lugubris, *Say.*
newmani, *Lec.*
Notoxus anchora, *Hentz.*
*Anthicus obscurus, *Ferte.*

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* Species marked with an asterisk have not been included in the list of Canadian Coleoptera.

[1] Three specimens taken by Dr. Milward.

Anthicus formicarius, *Ferte.*
*floralis, *Payk.*
scabriceps, *Lec.*
cervinus, *Ferte.*
*coracinus, *Lec.*
*Xylophilus piceus, *Lec.*
*fasciatus, *Mels.*

MELANDRYIDÆ.

*Cænifa pallipes, *Mels.*
Tetratoma truncorum, *Lec.*
Stenotrachelus arctatus, *Say.*[2]
Penthe obliquata, *Fab.*
pimelia, *Fab.*
Synchroa punctata, *Newm.*
Emmesa connectens, *Newm.*
Melandrya striata, *Say.*
*Xylita lævigata, *Hel.*
Spilotes quadripustulosus, *Mels.*
Hypulus simulator, *Newm.*
Serropalpus striatus, *Hel.*
Enchodes sericea, *Hald.*
Dircæa liturata, *Lec.*
*Symphora flavicollis, *Hald.*
*rugosa, *Hald.*
Hallomenus scapularis, *Mels.*
Eustrophus bicolor, *Fab.*
bifasciatus, *Say.*
tomentosus, *Say.*
Orchesia gracilis, *Mels.*

MORDELLIDÆ.

*Anaspis nigra, *Hald.*
flavipennis, *Hald.*
rufa, *Say.*
*Tomoxia inclusa, *Lec.*
Mordella melæna, *Lec.*
scutellaris, *Fab.*
*octopunctatus, *Fab.*
marginata, *Mels.*
Mordella lineata, *Mels.*
*serval, *Say.*[3]
triloba, *Say.*
*Mordellistena lutea, *Mels.*?
trifasciata, *Say.*
*limbalis, *Mels.*
*ornata, *Mels.*
scapularis, *Say.*
*tosta, *Lec.*
*varians, *Lec.*
*morula, *Lec.*
*unicolor.[4]
*divisa, *Lec.*
*liturata, *Mels.*
*discolor, *Mels.*
Pelecotoma flavipes, *Mels.*

MELOIDÆ.

Meloe angusticollis, *Say.*
Macrobasis Fabricii, *Lec.*
Epicauta Pensylvanica, *De Geer.*
vittata, *Dej.*

CEPHALOIDÆ.

Cephaloon lepturides, *Newm.*

ŒDEMERIDÆ.

Ascelera ruficollis, *Say.*
puncticollis, *Say.*

MYCTERIDÆ.

Mycterus scaber, *Hald.*[5]

PYTHIDÆ.

Pytho Americanus, *Kirby.*
*strictus, *Lec.*
Boros unicolor, *Say.*
*Rhinosimus nitens, *Lec.*

SCOLYTIDÆ.

*Crypturgus atomus, *Lec.*
*Cryphalus fasciatus, *Say.*
*mali, *Fitch.*
*materiarius, *Fitch.*

[2] A single specimen, taken on the Lake Shore. [3] Taken in the Township of Adelaide.
[4] Taken in Bosanquet. [5] A single specimen taken by Dr. Milward.

*Cryphalus pullus, *Zimm.*
*puberulus, *Lec.*
*Xyloterus retusus, *Lec.*
politus, *Say.*
*Xyleborus pyri, *Harr.*
*pubescens, *Zimm.*
*sparsus, *Lec.*
*plagiatus, *Lec*
*cælatus, *Eich.*
Tomicus calligraphus, *Germ.*
*cacographus, *Lec.*
pini, *Say.*
*Micracis suturalis, *Lec.*
*aculeatus, *Lec.*
*Chramesus hicoriæ, *Lec.*
*Phlorotribus limniaris, *Harr.*
Hylesinus aculeatus, *Say.*
*opaculus, *Lec.*
dentatus, *Say.*
Dendroctonus terebrans, *Lec.*
*simplex, *Lec.*
*Hylastes porculus, *Er.*
pinifex, *Fitch.*

MISCELLANEOUS NOTES.

Rearing Butterflies from the Egg.—In the last number of the *Canadian Entomologist* I mentioned that I had succeeded in inducing females of *P. ajax* to deposit eggs, by enclosing them in a keg placed over the growing food-plant—the paw-paw. The first female enclosed on May 16th laid a number of eggs, and another female was enclosed in the same keg on the 17th. I was obliged to leave home for some days, and returned on June 1st, when I found but six larvæ in the keg. These had hatched and attained a length of three-fourths of an inch within sixteen days. On the 5th of June the larvæ were mature and had stopped feeding; the whole time from the laying of the eggs being but three weeks. On the 20th one ♂ *Marcellus* emerged; on the 21st a ♀ *Marcellus*, and by the 23rd four others emerged, all *Marcellus*.

On the 1st June I put three ♀ *Ajax* into another keg; by the 2nd 37 eggs were deposited. These began to hatch on the 6th. From this lot I obtained 24 chrysalids, which began to give imagos by 3rd of July. From them I obtained 12 ♂ and 10 ♀, all *Marcellus*.

On June 7th I shut up a ♀ *Marcellus*, the first I had noticed flying this year. By the 23rd I had five larvæ from this lot. The imagos began to appear on the 4th of July, and gave three ♀ and one ♂, all *Marcellus*, not distinguishable from those produced from the eggs of *Ajax* as above.

So that the question of the identity of *Ajax* and *Marcellus* may be regarded as settled.

I have had no difficulty, by some means, in inducing other species to deposit eggs. On a young tulip tree I placed two black females of *Turnus (Glaucus)*, and have now several larvæ growing as the result. I have also raised two broods of *C. Philodice*, and the *Nisoniades lycidas*, and *N. pylades*, Scudder.

It is necessary in these experiments to watch carefully for small spiders, who very soon discover the eggs and devour them remorselessly. —W. H. EDWARDS, Coalburg, West Va.

FOOD-PLANT OF DARAPSA VERSICOLOR.—I enclose leaves of the plant on which the larvæ of *D. versicolor*, Harris, the rarest of our Sphinges, feed; it is a swamp plant, common in the vicinity of Brooklyn, N. Y.— W. H. EDWARDS.

[The plant has been kindly determined by Prof. Macoun to be *Cephalanthus occidentalis* (the Button Bush). It is, he states, a shrub growing on mud flats or along the low banks of streams; its leaves are opposite or in whorls of three leaves; its flowers are white growing in round heads about an inch across—hence the name.]

COLORADO POTATO BEETLE.—In addition to the localities mentioned in our last number, we have received a specimen of this destructive insect from Mr. N. H. Cowdry, Stratford, Ont., which was found there "on the sidewalk in a very mutilated condition." Mr. Saunders has received specimens from Sarnia, and has heard of its being found at Amherstburg. The last number of the *American Entomologist* mentions that it has been found also at Point Edward, the extreme southern end of Lake Huron. If prompt action be not taken by the farmers in the western section of the country, we shall soon, we fear, have to chronicle its spread over the whole of our country.

NOTE ON A HABIT OF CERTAIN INDIAN COLEOPTERA.—The Rev. A. B. Spaight, late Missionary to Northern India, has informed me of a fact frequently observed by him at Moultan, and which has, I believe, acquired additional interest from the circumstances of its being a disputed point amongst Naturalists.

It appears that certain large beetles belonging to the *Lucanidæ* and *Longicornia* are said to saw off small branches from trees in order to get at the sap upon which they feed. Mr. Spaight (who only began to study the habits of insects after he had left England) arrived in India under the impression that the jaws of these large beetles *(Lucanidæ?)* were solely intended for burrowing,—indeed, he had been told almost as much; what was his surprise then, upon first meeting with them in their native haunts, to see the huge jaws clasping a branch round which at the same time the beetle was rapidly whirling, so that in a short time the branch fell to the ground completely sawn through; whereupon the insect immediately set to work to suck up the sap!

Being struck with this apparently new fact, Mr. Spaight paid particular attention to it, and noticed the same thing over and over again,

so that he is quite sure about the correctness of his observations.—A. G. Butler, in the *Entomologist Monthly Magazine.*

Mimicry.—At a recent meeting of the Entomological Society of London, England, the President read the following extract from a letter, dated "Sarawak, 17th April, 1870," from Mr. A. Everett :—

"My brother has found two remarkable spiders. One, which we had not the means of keeping at the time, was lying with its legs pressed closely beside its body, and was white streaked with black in irregular fashion; when he called me to see it, I looked closely but in vain for it, the only thing visible on the leaf being apparently a patch of bird's dung; when it moved, one saw immediately what it was. The other is similar in colour and behaviour, but seems to belong to a different genus, and the resemblance to the droppings of a bird is not so completly deceptive. These would appear to be instances of protective mimicry, and as such will perhaps be of interest to you. I have another example, almost if not quite as evident: I had a caterpillar brought me, which, being mixed by my boy with some other things, I took to be a bit of moss with two exquisite pinky-white seed-capsules; but I soon saw that it moved, and examining it more closely found out its real character: it is covered with hair, with two little pink spots on the upper surface, the general hue being more green: its motions are very slow, and when eating, the head is withdrawn beneath a mobile fleshy hood, so that the action of feeding does not produce any movement externally; the shape is oval, and the edges are fringed with tufts of hair: it was found in the limestone hills at Busan, the situation of all others where mosses are most plentiful and delicate, and where they partially clothe most of the protruding masses of rock: I placed it in spirit, but it has become shrunken and turned to a dirty yellowish colour. Such things, however, require to be seen alive in order to properly appreciate the close resemblance they bear to the particular objects they resemble."

Mr. De Grey mentioned that he had often been struck by the resemblance of the caterpillar of Melitæa Cinxia to the flower of the plantain upon which it feeds, whilst the pupa resembled the seed of the same plant.

The Secretary exhibited a large woolly gall of the oak and a number of living specimens of Cynips ramuli which had emerged therefrom. The gall was found on the 24th of June, at Idsworth, near Horndean, by Sir J. Clarke Jervoise, Bart., who wrote respecting it as follows :—

"My attention was yesterday called to what I thought was a ball of sheeps' wool in a meadow where there were no sheep, and I placed it under a glass clock-shade for security. This morning I found the clock had stopped, and a quantity of flies were in the case and in the works of the clock. I never happened to have seen a similar growth on the oak, a

sprig of which is visible in the woolly gall, and I have sent some of the flies in spirits. There are more hatched out in the box since I placed the oak-gall in it." How many specimens of the Cynips hatched in the clock-case did not appear, but the box exhibited was found to contain upwards of eighty.—*Zoologist*.

DEATH OF PROF. LACORDAIRE.—We learn with regret that death has claimed the greatest of modern Coleopterists. Prof. Lacordaire died at Liége on the 18th July, in his 70th year.

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AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P.Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, N.Y.

ENGLAND.—Wm. Wesley, 81 Fleet Street, London, E. C. Subscription 5s. per Vol.

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TO OUR SUBSCRIBERS.

During the last few months the Editor and his valued contributors, Messrs. W. Saunders and E. Baynes Reed, have had the little leisure they are wont to devote to Entomology, so completely engrossed with the preparation of a Report on some of the Noxious Insects of Canada, for the Agricultural and Arts, and the Fruit Growers' Associations of Ontario, that it has been quite out of their power to issue a number of the *Canadian Entomologist*. In order to make some amends for this delay, we now issue a double number, and hope—we no longer venture to promise—to publish the closing number of the volume in a few weeks. We shall be glad to receive contributions from our friends in all quarters, and to obtain promises of aid for our *third* volume.

EXTRACT FROM A REPORT ON THE PLUM CURCULIO,

(Conotrachelus nenuphar.)

BY W. SAUNDERS, LONDON, ONT.

Read before the Meeting of the Fruit Growers' Association of Ontario, held in London, June, 1870.

The accompanying figure shows the curculio in all its stages. *a*, is the larva, *b*, the chrysalis, *c*, the perfect beetle, all magnified, the adjoining lines show the natural size, *d*, is a small plum with the curculio (natural size) working on it. One egg is deposited under the crescent cut, and a second incision is being made.

I shall now refer to some experiments of my own on this insect which will, I hope, add something to our knowledge of the creature's habits. I had seen it stated somewhere that the curculio was active at night, and I had also seen the

idea ridiculed, and being somewhat sceptical on the point, resolved to test it. Accordingly I went out about midnight with lantern and sheet, and on jarring one tree down came two curculios, and from another tree one. When they drop to the ground from jarring in the day-time they usually remain motionless for a good while, feigning death. But there was no shamming about these creatures taken at this time of night, for they commenced to run about at once on the sheet, and fearing they would fly they were quickly transferred to a pill box. They were then taken into a room where there was a lamp burning, when on opening the box one of them at once took wing attracted by the lamp, and flew around the light. Thinking this activity might be due in part to the stimulus of a bright light, I placed them in a dark room for a while, and then approached them with the faintest glimmer of light, just enough to enable me to see them, when I observed them running about very quickly, faster than I have seen them move in bright daylight. This ended the experiments for that time, and the insects were closely shut up in a box for safety.

The next night the operation was repeated, and two curculios taken from one tree as before. These manifested just the same symptoms of activity as their predecessors, and along with them (now five in all) they were put into a box having a glass lid, with a small branch from a a plum tree having five plums on it, each one of which had been carefully examined and found quite free from puncture or bite of any sort. The box was placed in a darkened room and covered with a black cloth so arranged that no light could possibly penetrate until its removal. Early in the morning the cloth was suddenly taken away and two of the curculios were found working on the plums, while the others were quiet or leisurely walking around in other parts of the box. The branch was at once taken out and examined: plum No. 1 had a puncture at the tip, hollowed out so that the skin was getting black; No. 2 was in the same state with a second large puncture in the side; No. 3 had two punctures on the tip, one large and one small one; No. 4, a small puncture near the base of the stem, while in No. 5 four eggs were deposited, and it was also punctured in four places, one of the punctures being very large, deep, and crescent shaped, a second quite shallow, barely through the skin. I observed that they were much less active in the morning than at night.

Being anxious to see how they would do their work in the day-time, another branch was cut with sound plums on it a little before noon and placed in the box with the same insects. When exposed to the sunlight they were nearly as active as in the night, occasionally flying around the box inside. They were left exposed under a slight shade afforded by a small tree and examined at noon, when it was found that two eggs had been deposited, this was within an hour from the time of their exposure. Again it was examined early in the evening, when the number of eggs deposited had increased to nine, and a great many punctures had been made on different parts of the fruit where the curculios had been feeding.

These experiments I think clearly prove that they work in the dark as well as in the light, feeding and depositing eggs at night as well as in the day-time—that is during the warmer parts of the season, for it should be observed that at the time I operated the nights were quite warm.

With regard to the best time for jarring, experience leads me to believe that the evening is preferable, provided the work is not undertaken too early, say about sunset, or if it is done in the morning the earlier the better. I will give you a little incident connected with evening jarring. Having just observed a curculio drop on the sheet where I was at work, and having a few minutes to spare I resolved to watch to see how long the creature would feign death. For half an hour a careful scrutiny was kept up, during which time it did not move a muscle. How long it would have continued in this state is uncertain, as I had no more time to devote to the experiment; just then an attempt was made to pick the curculio up, when, as soon as it was touched, it began to run vigorously. While watching this specimen another was observed on a low outer branch of the same tree which the slight previous jarring had failed to bring down. It remained quite still for a good while on the branch, then walked a few steps, stopping a while again, and so on, during the half hour it did not progress more than two inches in all. An attempt was now made to see if shaking would bring it down on the sheet. Beginning lightly the shaking was increased in rapidity every time until it became quite violent, much more so than any large tree could be shaken, but it maintained its hold on the limb and became more active between the intervals of shaking. Being satisfied that shaking would not do, jarring was tried, when a single tap brought it to the ground.

ON NEONYMPHA EURYTHRIS, FAB.

BY W. SAUNDERS, LONDON.

This butterfly appeared earlier than usual with us last year. It is not seen on the wing sooner than the 10th or 12th of June, but this season they were tolerably common as early as the 1st, and probably had been then flying for several days. The delight in the sunny openings found oftimes in partially cleared woods, also in wooded lanes and roads and the sunny edges of the forest, where by their peculiar jumping flight they may be readily recognized, sometimes singly, at other times sporting in twos and threes. For the first few days the specimens captured will be found to be nearly all the male sex, but after this the females begin to appear and both sexes are found together during the remainder of their short season of life which does not usually extend beyond the first week in July. Sometimes an odd specimen may be taken later than this, but

it is always battered and worn, as if the protraction of its life beyond the usual time had been attended by many struggles and fightings.

On the 4th of June, 1870, we enclosed a captured female in a pill box for the purpose of obtaining eggs. The box was not examined till the 7th, when several eggs were found attached to its sides. The length of the egg was 3-100ths of an inch. It was nearly globular in shape, flattened a little at the place of attachment. Its color was pale yellowish green, and it was covered with a very fine network, the spaces between the meshes being slightly depressed.

The young larva hatched on the 19th and 20th. The box was not examined on the 19th, and when looked into on the 20th, several of the young creatures were too much weakened for want of food to recover. There were two or three which promised well, but after the first few days only one survived, which has been watched over with much care and fed on grass.

Description of the larva fresh from the egg.—Length, 5½-100ths of an inch. Head very large, dark brown with a few yellowish hairs.

Body above dull whitish, with a dorsal and three lateral stripes of pale red, on each segment are a number of thick, short hairs or small spines, each arising from a minute tubercle and tipped with a small rounded knob. Under surface whitish, semi-transparent, feet and legs the same.

No description of this insect was taken between the first and second moultings, but after the second moult, July 20th, the following notes were taken :

Length .35 inch. Anterior segments nearly cylindrical, posterior onisciform. Head medium size, larger than second segment, flat in front, with a flattened ridge above ; color pale greenish, with a black dot on each side and a number of pale brown dots arranged nearly in transverse rows, and thickly covered with very short whitish hairs springing from small bulb-like tubercles ; mandibles dark brown.

Body above greenish grey, thickly covered with small whitish tubercles similar to those on head, from each of which arises a single short brown or reddish brown hair ; a reddish brown dorsal stripe, and a faint sub-dorsal line of the same on which is a row of dots of a similar color but of a little darker shade, most distinct on middle segments ; there is also a stigmatal band of the same, edged below with yellowish green, and a second faint lateral line between the sub-dorsal and stigmatal, the latter most distinct on anterior segments ; terminal segment forked.

Under surface pale whitish green, feet and prolegs greenish, semi-transparent.

Its growth was very slow for the next two months after which it ceased growing, becoming semi-torpid, eating a very little occasionally for a short time longer, and then it settled down for a lengthened fast which no morsel

however green and dainty would tempt it to break No perceptible change has taken place in its appearance up to the present, December 31, and will not, we presume, until the warmth of spring infuses new life into it The following description was taken a few days since:

Length half an inch—onisciform. Head large; bilobed, with each lobe slightly pointed above, appearing almost square when viewed from the front. Color yellowish brown, thickly covered with granulations of the same from which arise short brownish hairs visible only with a magnifier; there are two or three small black dots on each side, one larger than the other; mandibles tipped with black.

The body above is a little paler in color than the head, of a uniform pale brownish yellow throughout entirely covered with like granulations emitting also short brownish hairs. The second segment is constricted, giving the head a much more prominent appearance than it would otherwise have; it is also free from granulation on its anterior edge not observable when the larva is at rest; but when in motion this smooth edge appears, of a paler hue than the general color and sprinkled with a few black dots. The body is thickest from seventh to tenth segments, and there is a faint dorsal line of a darker shade most apparent on the posterior segments; terminal joint forked; stigmata small, nearly round, and black.

The under surface is similar in color and appearence to the upper, with a ventral row of faint brownish dots; feet and prolegs tipped with brown.

From the facts thus gathered, we can give a short summary of the history of this species. The butterfly appears from the 10th to 25th of June, depositing its eggs singly—fastened on blades of grass—from the middle to the last of the month. Duration of the egg stage, from ten to thirteen days. The larva is then hatched and continues growing until September, when having attained the length of about half an inch, it looks out for a hiding place in which to pass its long wintry sleep. The early spring calls it again to activity, when it begins to feed at once on the young and tender grass, completing its growth probably during the second or third week in May when it becomes a chrysalis, from which the butterfly appears, to commence afresh the circle of existence. In all probability our other two species belonging to this family—*Boisduvalii* and *Nephele*—have a similar history although they appear later in the season.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 110).

51. AMARA VULGARIS, *Latr.*—Length of body 4 to 4½ lines. Many specimens taken in lat. 65°, and in the Rocky Mountains.

Body black, glossy; above black-bronzed. Scape of the antennæ piceous; inner lobe of the maxillæ, and first joint of the outer palpi, testaceous; basilar impressions of the prothorax double, deepish, impunctured, the external one oblique; channel abbreviated anteriorly, with a punctiform impression beyond the middle: furrows of the elytra lightly drawn, indistinctly punctured; apex subacuminate or suddenly narrowed: legs black, with the hairs, spurs and claws testaceous.
Variety B. Bright, bronzed with a cupreous tint.

C. Wholly black.

[An European species, unknown to Dr. LeConte. Stated by Mr. Wm. Couper—but probably erroneously—to be common at Toronto.—*Can. Jour.* 1855, p. 256.]

[39] 52. AMARA INÆQUALIS, *Kirby.*—Length of body 4 lines. Several taken in lat. 53°.

Very like *A. vulgaris*, but the *two* first joints of the antennæ are rufous; the basilar impressions of the prothorax are not so deep; and the interstices of the furrows of the elytra are convex and uneven; in other respects there is little difference between them. [Previously described as *A. interstitialis*, Dej.; taken, according to Dr. LeConte (*Pro. Acad. Nat. Sci., Phil.*, June, 1855, p. 353), on Lake Superior, at Fort Simpson, Mackenzie River, and in Massachusetts, Pennsylvania and Illinois. Also found at Grimsby, and other places in Ontario.]

53. AMARA IMPUNCTICOLLIS, *Say.*—Taken in lat. 54°. [Common in Canada; for description *vide* Say's Ent. Works, ii. 463.]

54. AMARA PALLIPES, *Kirby.*—Length of body 3 lines. Only one speciman taken.

Body glossy; underside, mandibles, coxæ and tarsi piceous; upperside bronzed. Three first joints of the antennæ rufous; frontal impressions very slight, connecting line very distinct: dorsal channel of the prothorax nearly entire; basilar impressions rather punctiform, punctured; elytra not subacuminate: legs yellowish. [Taken on Lake Superior and in Northern New York, according to LeConte; also in Ontario.]

[40] 55. AMARA LAEVIPENNIS, *Kirby.*—Length of body 3⅓ lines. Three or four specimens taken in lat. 54°.

Body glossy; the underside, legs and antennæ black; upperside black-bronzed: frontal impressions very slight: prothorax smooth, with the basilar impressions very faint: furrows of the elytra very lightly drawn, and sometimes sub-interrupted; intermediate trochanters piceous. ["Lake Superior, one pair; a female from Massachusetts, sent by Dr. Harris" (LeConte).]

56. AMARA DISCORS, *Kirby*.—Length of body 4 lines. One specimen only taken.

This species has somewhat the aspect of a *Harpalus*, but it exhibits the true characters of *Amara*: it appears to be related *A. discrepans*, Stephens. Body dark piceous, glossy. Upper-lip, palpi, mouth and antennæ ferruginous: prothorax a little narrowed behind; bead of the lateral margin rufous; basilar impressions rather slight: elytra less glossy than the rest of the body, the infinitely minute and numerous granular reticulations of their substance being more conspicuous than usual; the furrows of the elytra from minute punctures exhibit a slight appearance of crenulations: legs pale chestnut. [Unknown to Dr. LeConte; the student of the *Amaræ* is referred to his paper on this genius in the Pro. Acad. Nat. Sci. Phil., June 1885, p. 346, for much valuable matter and fuller descriptions.]

[41] 57. HARPALUS PLEURITICUS, *Kirby*.—Taken frequently in lat. 54°. [For description *vide* Mr. Sprague's *Carabidæ*, CAN. ENTOM. ii. p. 96. Taken in Ontario and, according to Dr. LeConte, in Minnesota and Winnipeg.]

58. HARPALUS BASILARIS, *Kirby*.—Length of body 4 lines. Taken with the preceding, and in equal numbers.

This species differs from the preceding, which it nearly resembles, in having the two first joints of antennæ yellow, and the remainder dusky; in having the prothorax still wider in proportion to its length, with its posterior angles more acute and impunctured, and with narrower basilar impressions also without punctures; its lateral margin is also black and less prominent: the side-covers of the elytra are likewise black: the legs are dark-piceous, with yellowish-red trochanters. In other respects it resembles *H. pleuriticus*. [Unknown to Dr. LeConte.]

[42] 59. HARPALUS OCHROPUS, *Kirby*.—Length of body 3⅓ lines. [No locality stated.]

This comes very near *H. pleuriticus*, but is considerably smaller; the antennæ are longer; the prothorax is impunctured at the base, its basilar impressions are linear; the side covers of the elytra are chestnut; and its thighs are more robust in proportion. [Unknown to Dr. LeConte; supposed by him to be perhaps *H. desertus*, Lec.]

60. HARPULUS INTERPUNCTATUS, *Kirby*.—Plate vii. fig. 8.—Length of body 5½ lines. Many taken in lat. 54°.

Body proportionally longer than in the antecedent species, black, glossy, not depressed. Head triangular, with a pair of confluent red dots, visible only in the sun, between the eyes; antennæ shorter than the prothorax, with the scape and last joint of the palpi rufous: prothorax subquadrangular; anterior angles rounded; dorsal channel drawn from the apex to the base; punctured especially posteriorly, disk impunctured, transversely wrinkled; basilar impressions shallow; lateral margin dilated posteriorly; elytra rather deeply furrowed, furrows impunctured, interstices convex, very minutely but not thickly punctured: the four anterior tarsi of the male are furnished with a thick brush of vesicles, not arranged in a double series, as in other species of this genus. [Placed, with a mark of interrogation, in LeConte's List, as a synonym of *Anisodactylus melanopus*, Hald., a species taken in Canada.]

[43] 61. HARPALUS LONGIOR, *Kirby*.—Length of body 5¼ to 5⅓ lines. Two specimens taken, the largest in lat. 54°.

Body black. Upper-lip piceous; antennæ, palpi and legs reddish-tawny, the first longer than the prothorax; the nose terminates anteriorly in a reddish membrane or rhinarium, prothorax quadrangular with all the angles rounded, rather longer than wide; dorsal channel anteriorly abbreviated; lateral margin minutely punctured, much depressed, especially at the posterior angles; basilar impressions double, shallow, and minutely punctured; elytra very little glossed, more than twice the length of the prothorax, furrows impunctured with convex interstices, the lateral ones with some scattered very minute punctures; the vesicles on the sole of the four anterior tarsi of the male are arranged as in the other *Harpali*.

Both the specimens taken in the expedition are males, or I should have supposed the unusual difference in their size was sexual; probably the small one was taken in a higher latitude. [Unknown to Dr. LeConte; thought by him to be perhaps *H. vagans*, Lec.]

62. HARPALUS LATICOLLIS, *Kirby*.—Length of body 5½ lines. A single specimen taken.

This insect very closely resembles *H. interpunctatus*; it differs principally in having a rather wider prothorax with all the angles rounded, with the dorsal channel abbreviated anteriorly, and with only the base very indistinctly punctured; the interstices of the furrows of the elytra are also without punctures, and there is a single punctiform impression in the usual situation adjacent to the second furrow. [Previously described as *Anisodactylus nigerrimus* by Dejean.]

[44] 63. HARPALUS [ANISODACTYLUS] CARBONARIUS, *Say*.—Two specimens taken in lat. 54°. [Taken also in Canada; for description *vide* Say's Ent. Works ii. p. 460.]

64. HARPALUS ROTUNDICOLLIS, *Kirby*.—Length of body 5½ lines. Two specimens taken.

rounded angles; basilar impressions shallow, round and punctured: the elytra exhibit a silky lustre from the granulations on the surface; there is a single punctiform impression in the usual situation near the apex; in this and the following species these organs are transversely truncated with a slight sinuosity; legs rufous or rufo-piceous, with black thighs; coxæ and trochanters rufous. [A variety, according to LeConte, of *H. amputatus*, Say (Ent. Works, ii. 546), a species taken in "Kansas, New Mexico, Saskatchewan, Montreal, Canada."]

[45] 65. HARPALUS STEPHENSII, *Kirby*.—A single specimen, taken in lat. 54°. [A synonym of *H. amputatus*, Say.]

[46] 66. STENOLOPHUS VERSICOLOR, *Kirby*.—Length of body 2½ to 2¾ lines. Three specimens were taken in lat. 54°.

Body dusky-black, glossy. Palpi, mouth and scape of the antennæ rufous; prothorax scarcely longer than wide, rounded behind, with the basilar impressions punctured: elytra reddish-brown,—viewed in the sun or in the light, they exhibit a changeable tint of violet; a punctiform impression adjoins the second furrow; apex slightly sinuated; epipleura yellow: thighs dusky, especially the posterior pair, which are larger than the others; tibiæ and tarsi rufous.

The female has less of the violet tint, and the elytra are of a pale mahogany colour.

Variety B. With the two first joints of the antennæ rufous; legs yellow. [Previously described as *S. fuliginosus* by Dejean; is taken in Ontario.]

ON THE LARVA OF *DIPHTHERA DERIDENS*, *Guénée*.

BY W. SAUNDERS, LONDON, ONT.

A single specimen of the larva of this insect was taken crawling on a fence on the 1st of October, 1866. It must be very rare in this locality, as I had never seen it before, nor have I observed it since, nor ever captured a specimen of the imago, which is very handsome. Food plant unknown.

Length 1.20 in., cylindrical.

Head medium sized, rather flat, slightly bilobed, of a pale greenish-white color, with a large patch of black on each lobe above and a smaller one below just above mandibles. Mandibles black, with a streak of white on each.

Body above pale greenish-white, semi-transparent, with transverse rows of tubercles of the same color, from which arise tufts of long, fine, silky, white hairs. On second segment the hairs overhang the head, and there are here one or two black ones on each side mixed with the white.

A dorsal line of pale green; stigmata pale white, edged very faintly with pale reddish.

Under surface, feet and prolegs of the same color as upper surface.

The larva entered the chrysalis state shortly after its capture, and produced the imago on the 11th of June, 1867.

ENTOMOLOGICAL GLEANINGS.

PAPER NO. III.

BY W. SAUNDERS, LONDON, ONT.

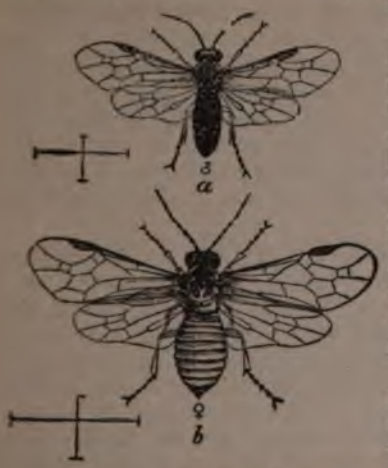
THE CURRANT WORM IN TROUBLE.

On the 21st of July at a quarter past seven in the evening we were passing around among the currant and gooseberry bushes watching the manipulations of a few of those well known foes, the larva of *Nematus ventricosus*. They were feeding away voraciously with perennial appetites, when a disturber of their peace appeared among them in the shape of a small black ichneumon fly which fastened itself on the body of one of their number, and began to deposit its eggs by means of a sharp ovipositor, dexterously thrust through the skin of its victim, whose jerks and writhings while indicating a very uneasy state, failed to shake off the tormentor. The fly remained some time attached, and so intent was it in fulfilling the instincts of its nature that a capture was made of both fly and larva, by the sudden movement of a pill box, but while endeavoring to transfer them to the inside of a tumbler so that their further operations might be better observed, the fly suddenly escaped and was seen no more; the larva also died before reaching maturity, so that its further history could not at that time be developed.

New Food Plants.

A few days after this, and about the end of the month, we were not a little astonished at finding a colony of the worms about a quarter of an inch long feeding on the leaves of the black currant, which we had previously supposed to be entirely exempt from their attacks. These were collected and fed on black currant leaves until about half grown, when they sickened and died. On the 7th September a smaller number were found feeding on the leaves of a plum tree, taken and watched in the very act, the

leaves were partially eaten all around them, and the worms about half grown. These were also taken and fed in confinement on plum leaves, which they ate for several days, but from some cause they all died before maturity, whether from confinement, or the unsuitable character of the food it would be difficult to determine. From the position of the leaves on which these larva were found we thought it probable that the eggs had been deposited on the plum leaves by the parent fly. It was an occasion of regret afterwards that some had not been allowed to remain where nature had placed them, to see whether they would have reached maturity on food which we should regard as so uncongenial.



The figures here given represent the perfect fly on an enlarged scale, the hair lines at the sides showing the natural size; *a* is the male, *b* the female.

Coaxing Butterflies to Deposit Eggs.

In the July number of the *Canadian Entomologist*, page 115, is a paragraph from Mr. W. H. Edwards, detailing an ingenious method of his, adopted with the view of obtaining eggs from butterflies by enclosing them in gauge-covered nail kegs, without bottom or top, along with a growing plant of such species as their natural instincts prompt them to deposit on. Carrying out the same idea in another form, and one better adapted to the purpose where large bushes or trees are concerned, we used good-sized muslin bags, so tied as to enclose a small branch or portion of the plant or tree with a few only of the leaves remaining on it, so as to lessen the labor of looking for the eggs and watching when they are deposited. A little ingenuity will enable one by the use of small bits of stick or wire to expand the bag so as to give plenty of room for the insects to flit about inside, and prevent its collapsing with a shower of rain, and we think that by modifications of this method success in obtaining eggs from almost all our moths as well as butterflies might be secured.

We had often tried to obtain eggs from our commonest red butterfly, *Danais archippus*, by confining them in boxes within doors, but never succeeded in this way; but about the last of June, 1870, we captured four females and shut them up in a bag as described, tied on a plant of the common milkweed *Asclepias cornuti*, enclosing a few leaves only.

Body brownish, black, glossy. Antennæ length of the prothorax, as well as the tip of the palpi, rufous: prothorax wider than long, with

As early as the next morning they had deposited a considerable number of eggs, which operation was continued for about another day, when we counted them and found 150 in all, laid singly on all parts of both sides of the leaves, and also on the leaf stalks and on the muslin bag in which they were confined.

The eggs were 1-25th of an inch long, and a little less in width—exact measurement, 34-100th of an inch. They were conical, quite flat at the base where attached to the leaf, with about 25 raised striæ or lines, and about the same number of cross lines between each stria, and in the meshes of the net work thus formed were slight cavities. Their color was white, with a faint yellowish tinge, and they were *very firmly* attached to the leaves.

Quite a number of eggs hatched on the 5th of July, but having lost the date on which the butterflies were enclosed, the exact duration of the egg state cannot just now be given, but we believe it did not exceed six or seven days. The newly hatched larvæ were 1-10th of an inch long, with a large black head on which were a few dark brown hairs. The body was dull white with a slight bluish tint, spaces between the segments dull yellowish, there were a few black hairs on each segment, and the underside was similar in color to the upper but with fewer hairs, feet black; prolegs tipped with black. We had fully intended tracing the history of this larva out, noting the number of its moultings and the changes in appearance each time, but want of leisure prevented us.

The Pear Tree Slug.

This disgusting little larva, the progeny of a little blackish sawfly, has been very abundant during the past season, and has been the subject of some notes and experiments. In the first place we noted that there were two broods in the season. The parents of the first brood, which pass the winter in the chrysalis state, appear on the wing about the second or third week in May, depositing eggs from which the slugs are hatched, becoming full grown from the middle to the end of June, then entering the chrysalis state underground; the second brood of the flys make their appearance late in July. This year we noticed them at work depositing eggs on the 21st, the young slugs were abundant and about a quarter of an inch long on the 8th of August, and by the 6th of September many of them were full grown. With us they were much more destructive to cherry trees than to pears, consuming the upper surface of the leaves, some giving the trees a scorched and sickly aspect, in many cases the foliage fell off, leaving the trees almost bare.

As soon as the slugs were observed at work in spring, they were treated to a plentiful supply of dry sand thrown up into the higher branches with a shovel, and shaken over the lower ones through a sieve, which stuck thickly to their slimy skins, completely covering them up. Thinking we must have mastered them by so free a use of this long trusted remedy, we

took no further heed of them for some days, when to our surprise they were found as numerous as ever. The next step taken was to test this sand remedy accurately to see what virtue was in it. Several small branches of pear trees were selected and marked, on which there were six slugs, and these were well powdered over—entirely covered with dry sand; on examining them the next morning it was found that they had shed the sand-covered skin and crawled out free and slimy again. The sand was applied a second and a third time on the same insects with similar results; and being convinced that this remedy was of little value, they were treated to a dose of hellebore and water, which soon finished them. Ashes were now tried on another lot, the same way as the sand had been, with very similar results. It was also intended to try fresh air-slacked lime, which we believe would be effectual, but having none on hand just then, the experiment was postponed, and the opportunity of testing it lost for the season. We must not omit mention of an experiment with hellebore. On the 13th of August at 8 a. m. a branch of a cherry tree was plucked, on which there were sixty-four slugs; the branch had only nine leaves, so it may be readily imagined that they were thickly inhabited. A dose of hellebore and water was showered on them about the usual strength, an ounce to the pailful, when they soon manifested symptoms of uneasiness, twisting and jerking about in a curious manner; many died during the day, and only six poor sickly looking specimens remained alive next morning, and these soon after died.

ACCENTUATED LIST OF CANADIAN LEPIDOPTERA.

BY. E. B. REED, LONDON, ONTARIO.

(Continued from page 123.)

*** For Rules of Pronunciation see page 122.

COLIAS CHRYSOTHEME—*Chrysoth'eme*, probably meant for chrysothemis, a name given by Homer to Iphigenia, daughter of Agamemnon.

——— PHILODICE—*Philod'ice*. Gr. Philos, a friend; Dice, one of the hours or seasons, this insect being common through spring, summer and autumn.

TERIAS—*Ter'ias*. Probably from Pteria, a city in Cappadocia, Asia Minor.

——— LISA—*Li'sa*. Probably from Lisæ, a city of Macedonia.

DANAIDÆ—*Dana'idæ*. The family of which the genus *Danais* is the type.

DANAIS—*Dan'ais*. From Danai, a name often given to the ancient Greeks after Danaus, one of their kings.

——— ARCHIPPUS—*Archip'pus*. A king of ancient Italy.

NYMPHALIDÆ—*Nympha'lidæ*. The family of which *Nymphalis* (a genus of exotic butterflies) is the type.

ARGYNNIS—*Argyn'nis*. A surname of Venus, from the temple erected in her honour by Agamemnon on the death of his favorite Argynnis.

——— CYBELE—*Cyb'ele*. An Heathen Goddess, wife of Saturn.

——— MYRINA—*Myri'na*. A city in Asia Minor.

——— BELLONA—*Bello'na*. The Heathen Goddess of War.

——— APHRODITE—*Aphrodi'te*. The Grecian name of Venus, the Heathen Goddess of Love, in allusion to the fable of her having sprung from the sea foam "Aphros."

ARGYNNIS—COLUMBINA—*Columbi'na.* A feminine form of Columbus, the discoverer of America.
——— FREYA—*Freya.* The Scandinavian Goddess of Love.
MELITAEA—*Melitae'a.* A town in Thessaly.
——— PHAETON—*Pha'eton.* A mythological personage, famous for his unsuccessful attempt to drive the Chariot of the Sun.
——— HARRISII—*Harris'ii.* Named after Dr. T. W. Harris, the late talented State Entomologist of Massachusetts.
——— NYCTEIS—*Nyc'teis.* From Greek *nux*, night, in allusion to the dark colouring of the under side of the wings.
——— THAROS—*Tha'ros.* Probably meant for Pharos, a celebrated island in the Bay of Alexandria, famous for its lighthouse.
GRAPTA—*Grap'ta.* From the Greek "Grapho," to write or inscribe, in allusion to the letter-like markings of the under side of the wings of this genus.
——— INTERROGATIONIS—*Interrogatio'nis.* From the silver markings on the under sides of the wings like notes of interrogation (? ?).
——— COMMA—*Com'ma.* From the comma-like marking on the under side of the wings.
——— FAUNUS—*Fau'nus.* One of the heathen Roman gods, the great patron of the Art of Agriculture.
VANESSA—*Vanes sa.* Probably from Swift's poem of Cadenus and Vanessa, in which the Dean *(Decanus)* tells the story of his love for Esther *(Essa)* Vanhombrugh.
——— J-ALBUM—*J-Album.* The white J, from the J-like mark on the under side of the wings.
——— MILBERTI—*Milber'ti.* Milbert's butterfly.
——— PROGNE—*Prog'ne.* A daughter of Pandion, King of Athens.
——— ANTIOPA—*Antiopa.* The mother of Amphion, the celebrated musician.
PYRAMEIS—*Pyrameis.* Greek Purame, a fire basket, in allusion to the bright flame-like color of this genus.
PYRAMEIS ATALANTA—*Atalan'ta.* A celebrated beauty, who made all her lovers run races with her on the penalty of death if they could not catch her.
——— CARDUI—*Car'dui.* Feeds on thistle *(Carduus nutans).*
——— HUNTERA—*Hunt'era.* Hunter's butterfly.

LIST OF COLEOPTERA.

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 133.)

CURCULIONIDÆ.

Dryophthorus corticalis, *Say.*
Rhyncolus ——— ?
Cossonus corticola, *Say.*
*Sitophilus nubilus, *Schr.*
pertinax, *Oliv.*
*cinerea, —.
*Ceutorhynchus septentrionalis, *Sch*
*inæqualis, —.
*Anthonomus suturalis, *Lec.*
quadrigibbus, *Say.*
*Otidocephalus scrobicollis, *Sch.*
Erirhinus mucidus, *Say.*
Magdalinus olyra, *Hbst.*
Pissodes strobi, *Peck.*
nemorensis, *Germ.*
affinis, Rand.
Lixus cancavus, Say.

*Copturus quercus, *Say*.
*oculatus, *Say*.
*oblongus, —.
Conotrachelus posticatus, *Sch*.
nenuphar, *Hbst*.
*anaglypticus, *Say*.
*cratægi, —.
*Rhyssematus palmacollis, *Say*.
Mononychus vulpeculus, *Fab*.
Grypidius —— ?
Cryptorhyncus luctuosus, *Sch*.
obliquofasciatus, *Sch*.
Baridius —— ?
*Madarus undulatus, *Say*.
*Læmosaccus plagiatus, *Fab*.
*Panscopus erinaceus, *Say*.
Balaninus caryatrypes, *Sch*.
*Phyxelus glomerosus, *Sch*.
Aphrastus —— ?
Phytonomus —— ?
Hylobius pales, *Hbst*.
*picivorus, *Sch*.
Listroderes —— ?
Polydrosus elegans, *Couper*.
Sitona lepidus, *Sch*.
Arrhenodes septentrionis, *Hbst*.
Apion —— ?
Ithycerus curculionoides, *Hbst*.
Attelabus bipustulatus, *Fab*.
Cratoparis lunatus, *Fab*.
*Brachytarsus variegatus, *Say*.
*Platyrhinus fasciatus.
Piaxorhinus —— ?
Bruchus pisi, *Linn*.

The above list of *Curculionidæ* is as full as I can make it at present, but I have a number of species not yet identified; it is a family of acknowledged difficulty, the American species of which have never yet been thoroughly worked up by any competent Entomologist.

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* Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

ENTOMOLOGICAL SOCIETY OF CANADA.

A very poorly attended meeting of the Society was held at the Canadian Institute, Toronto, on the 5th of January. The following gentlemen were elected members:

ALEXANDER M. ROSS, Esq., M.D., Toronto;
J. GAMBLE GEDDES, Esq., Toronto; and
PROF. J. M. B. SILL, Detroit, Mich., a Corresponding Member.

The Secretary-Treasurer laid the following Financial Statement for the year 1870 upon the table:

RECEIPTS.

By Balance from 1869	$ 0 85
" Members' subscriptions paid	20 00
" Sale of cork and pins	39 42
" " Lists of Lepidoptera Coleoptera	2 95
" Grant from Agricultural Association	400 00
" " " Fruit Growers' Association	50 00
" London Branch	20 00
" Donation from Mr. J. Pettit	15 00
" Grant from Agricultural Association for Wood Cuts	106 77
	$654 99

EXPENDITURE.

To Printing account, *Canadian Entomologist*, 1869	$ 81 40
" Books for Library	30 95
" Expenses, *re* Report	11 40
" Cabinet for Agricultural Association (expenses)	1 85
" " for London Branch	75 00
" Cork and charges	45 57
" Pins and charges	31 20
" Postage, $10.20; sundries, $2.75	12 95
" *Canadian Etomologist*, 1870	67 75
" Wood Cuts for Report	156 77
" Preparation of Report	100 00
" Balance, December 31, 1870	40 15
	$654 99

"CANADIAN ENTOMOLOGIST" ACCOUNT.

RECEIPTS.

By subscriptions	$ 92 61
" Entomological Society	67 57
	$160 36

EXPENDITURE.

To Printing	$ 114 87
" Postage and Express	9 48
" Studley & Co., *American Entomologist*	36 01
	$ 160 36

Members of the Society are respectfully notified that their subscriptions ($2) are now due for the year 1871. From the above statement it will be observed that many members are also in arrears for the year 1870.

All communications and remittances should be addressed to the Rev. C. J. S. Bethune, Trinity College School, Port Hope.

INCORPORATION OF THE ENTOMOLOGICAL SOCIETY.

Our readers will no doubt be pleased to learn that a Bill is now before the Legislature of Ontario, for the incorporation of the Entomological Society, under the Agricultural and Arts Act. The effect will be to place it upon the same footing as the Fruit Growers' Association of Ontario, with an annual grant of $500 per annum.

A general meeting of the Society will be called as soon as the Bill has passed the Legislature. We shall refer to the matter at greater length in our next issue.

SIXTH ANNUAL REPORT OF THE LONDON BRANCH OF THE ENTOMOLOGICAL SOCIETY OF CANADA,

For the Year Ending December 31st, 1870.

At the close of another year it becomes the pleasing duty of your Committee to present this the Sixth Annual Report.

The past season has been a favorable one for the Society. Our financial Report exhibits a good balance in hand after payment of all current expenses. Owing to the generous support the Society continues to receive, our roll of members still contains thirty-three names. Again we would thank our friends for their continued assistance to this the only Scientific Society at present existing in the "Forest City." With the liberal donation of the Parent Society we have been enabled to purchase a magnificent cabinet. To prepare it for the reception of insects will be a work of some little time, but we trust in due course to see its drawers gradually filled with choice specimens from all quarters. London has fairly earned a provincial reputation for its Entomological collections. At the Western

Fair held in September, four prizes were obtained by our members, and the proceeds as usual transferred to our Treasury. Efforts have been recently made to induce the Society to keep its material and hold its meetings in the "Mechanics' Institute" of this city now in course of reconstruction. Nothing definite has yet been done in the matter, but your committee would heartily recommend any co-operation with the Institute that can be effected without infringing on the distinctive features and objects of our Society. The publication of the "CANADIAN ENTOMOLOGIST" is still maintained and meets with fair encouragement we believe. We have every reason to hope that the Agricultural Association of Ontario will see fit to continue their grant of $400 to the Parent Society during the coming year. We are glad to learn that under the auspices of the Parent Society a varied and useful report has been prepared on insects affecting field and fruit crops, and the Association are having it printed and well illustrated with engravings, which they have most liberally provided. In this work, also, the Fruit-Growers' Association of Ontario has given most material assistance by a donation of $50 towards engravings. We hope to see these annual reports kept up, and believe that most excellent results may be obtained therefrom by their inducing both Agriculturists and Fruit Growers to become a little better acquainted with the habits and customs of their insect friends and foes. We would in conclusion again urge upon our members to assist by all means in their power, in procuing for the Society, any information that may be brought to their notice respecting any of the various species of the Insect world. We can assure them it will be gladly received. We would also remind them, that any contributions to the cabinet will be most welcome.

EDMUND BAYNES REED, *Secretary-Treasurer.*

WILLIAM SAUNDERS, *President, London Branch.*

TREASURER'S STATEMENT FOR THE YEAR ENDING DECEMBER 31, 1870.

RECEIPTS.—Balance from 1869, $5.81; Members' Subscriptions, (28), $56.00; Arrears for 1869, $4.00; sale of Insect case, $2.00; for the use of Apparatus, $10.75; from Parent Society, grant for Cabinet, $75.00; from Parent Society, grant to E. B. Reed, Travelling expenses, $12.00. *Western Fair Prizes.*—John M. Denton, $8.00; Rev. G. M. Innes, $6.00; Wm. Saunders, $5.00; London Branch, $3.00; E. B. Reed, Judge s fees, $3.00;—Total $190.56.

DISBURSEMENTS.—Annual Subscriptions, Parent Society, $20.00. *Repaid Loan on Apparatus.*—J. H. Griffiths, $2.00; J. M. Denton, $2.00. Western Fair expenses, $5.00; 12,000 pins, $12.00; Printing Report for 1869, $3.00; Cabinet, $75 00. *Parent Society.*—E. B. Reed, Travelling expenses, $12.00; Engravings, etc., as per account, $30.51. Advertising, postage, etc., $16.25; Cash in hand, $12.80;—Total, $190.56.

LIST OF MEMBERS FOR 1870.—W. Saunders, President; C. Chapman, Vice-President; E. B. Reed, Secretary-Treasurer; J. M. Denton, Curator; H. Becher, W. Barker, Dr. V. A Brown, Hon. J. Carling, Wm. Carling, S. Chadwick, James Farley, J. H. Griffiths, Rev. G. Gordon, Very Rev. Dean Hellmuth, Rev. J. M. Innes, J. Jeffrey, J. Law, Dr. Landor, W. M. Moore, Dr. Charles Moore, J. Macbeth, B. A. Mitchell, J. McMechan, S. Mummery, J. Nitchske, A. Puddicombe, Rev. A. Sweetman, A. G. Smyth, J. Symmonds, Dr. Sippi, E. A. Taylor, F. Westlake, I. Waterman.

OFFICERS FOR 1871.—C. Chapman, President; J. H. Griffiths, Vice-President; E. B. Reed, Secretary and Treasurer; J. M. Denton, Curator.

NEW BRANCH OF THE ENTOMOLOGICAL SOCIETY AT KINGSTON, ONT.

It is with much gratification that we announce to our readers that a new Branch of the Entomological Society of Canada has been organized at Kingston, Ont. We trust that it will go on and prosper, and emulate in hearty work and zeal the active Branch at London, which has been in successful operation for six years. The following letter has been addressed to us as Secretary to the General Society:

"DEAR SIR,—I have been instructed to inform you that on the 16th instant several gentlemen met and formed a Branch of the Entomological Society of Canada, subject, of course, to the acceptance or rejection of the Parent Society. We passed By-Laws, a copy of which I enclose for your perusal and approval. We likewise elected the following Officers:—Prof. N. F. Dupuis, President; E. H. Collins, Vice-President; and R. V. Rogers, jr., Secretary-Treasurer.

I trust that you will lay our case before the next meeting of your Society, and let us know whether we are accepted or not as soon as possible.

The original members are, Prof. Dupuis, E. H. Collins, O. Meyers, Dr. Neish, T. C. Wilson, and myself.

Yours etc. (Signed) R. VASHON ROGERS, Jun.

Kingston, Jan. 25, 1871."

DEATH OF MR. A. S. RITCHIE.

We were very much grieved to learn that Entomology has lost one of its most ardent students in this country, by the unexpected death of Mr. A. S. Ritchie, of Montreal, one of Editing Committee of the *Canadian Naturalist* and *Geologist*, and author of many valuable and interesting papers on various subjects in Natural History. In our next issue we hope to be able to give further particulars respecting this sad event; at present we have only received information of the bare fact of his death.

At a recent meeting of the London Branch of the Entomological Society, the following resolutions were unanimously adopted:—

1. That the members of this Society have heard with deep regret of the sudden and unexpected death of Mr. A. S. Ritchie, of Montreal. We feel that Entomology has lost in him a warm advocate and an industrious student, and we a valued fellow-labourer. We tender our heartfelt sympathies to his bereaved family and friends in their great affliction.

2. That copies of the above resolution be forwarded to Mrs. A. S. Ritchie, the Secretary of the Natural History Society of Montreal, and the Editor of the *Canadian Entomologist.*

MISCELLANEOUS NOTES.

COLLECTING BEETLES IN AUTUMN AND WINTER.—I send you a few specimens of Coleoptera, some of which I think will prove acceptable. In the bottom of the quill you will find *Olisthopus micans*, Lec., and *Bembidium frontale.* In the middle *Sylvanus advena*, *S. Surinamensis*, and *Lathridius publicarius.* In the outer part *Loricera Neoscotica*, *Platynus Ruficollis*, *P. fuscescens*, Chaud.—The latter is not in Leconte's list. Except *Sylvanus* and *Lathridius*, these were taken late in November in a swamp by *sifting* the leaves from the dry spots (usually taken from the sunnyside of an old log) over a cloth. I mention the mode of capture as it may be useful to you, and late in the season will be found the most successful. For a sieve I used a piece of net, such as is put over horses in fly-time, stretched over a hoop. Many common species were also taken. By the same process—using a fine sieve from a fanning mill—I obtained from a little hay, leaves, etc., that had accumulated about the sills of a barn, between 30 and 40 species of beetles, several new to my collection and two or three *(Trichopterygidæ)* that Dr. Horn supposes to be new to science. I think that early in spring the sifting process would be found useful about out-buildings, especially a barn or stable, as many insects are brought from the field in the hay, grain, etc.—JOHNSON PETTIT, Grimsby, Ont., Dec. 29th, 1870. [We are much obliged to our friend Mr. Pettit, for the interesting specimens that he has sent us, and shall be glad to receive further particulars from him respecting his captures and modes of collection.—ED. C. E.]

REARING BUTTERFLIES FROM THE EGG.—I see by the July number of the Entomologist—you may not know that it has penetrated to this corner of the world—that Mr. Edwards has published an account of his method of obtaining butterflies eggs. Last June he wrote me of his success, and a day or two before I left America I put the experiment to a proof on a small scale, using the cans used for preserved vegetables in lieu of a better substitute for Mr. Edwards "powder keg." In this way I obtained quantities of eggs of *Eud. Pylades* on clover and of *Neon. Eurytris* and *Hesp. Mystic* on grass. I had previously found eggs of *Pylades* in abun-

dance in the fields, and had obtained some of those of *Mystic* from confined specimens, but in the latter case they were always laid loosely in the box, never attached, as those of other confined Hesperians. So far as I know, the eggs of *Eurytris* had never been obtained previously. I have boxed large numbers both of this and of *Pylades* but invariably without result. I trust that others will be induced to try Mr. Edwards's simple plan by which we may very greatly increase our knowledge of the earlier stages of butterflies.—SAMUEL H. SCUDDER, Cairo, Egypt, Nov. 15th, 1870.

NOVA SCOTIAN LEPIDOPTERA.—At a Meeting of the Institute of Natural Science, Halifax, N. S., on Nov. 14th, the President J. M. Jones, Esq., read a paper "On the Diurnal Lepidoptera of Nova Scotia, Rhopalocera, Part 1." The following species were common in the province, *Papilio turnus* Linn., *Pieris oleracea* Harris, *P. rapæ* Boisd., *Colias philodice* Godt., *Argynnis aphrodite* Fabr., *Argynnis myrina* Cram., *Melitæa tharos* Cram., *Grapta C. argenteum* Kirby, *Vanessa antiopa* Linn., *Pyrameis cardui* Linn., *P. Huntera* Smith, *Nymphalis arthemis* Drury, *Erebia nephele* Kirby, *Satyrus alope* Fabr.; while *Danais archippus* Fab., *Melitæa ismeria* Boisd., *Grapta interrogationis* Godt., *G. comma* Harris, *Vanessa J. Album* Boisd., *V. milberti* Godt., *Pyrameis atalanta* Linn., *Nymphalis dissipus* Godt., *Debis Portlandia* Fabr., were rare. The author dwelt upon the introduction of *Pierie rapæa* into this part of the Canadian dominion within the last few years, and alluded to its abundance last summer in the neighbourhood of Halifax, where it did an immense amount of damage to the cauliflower crops. He mentioned the probable benefit that would arise from the introduction of the house sparrow of England *(Pyrgita domestica)* that great enemy of caterpillar life, which would amply repay the trouble and expense of importation. At the present time the caterpillars were almost free from molestation, and it was but proper, when possible, on the introduction of an insect pest, to introduce also its known enemy. The author had observed that even in so small a country as Nova Scotia many species of butterflies were quite local in distribution, and species quite common on one side of the province were altogether unknown on the other, although the distance between such positions was not more than thirty miles. Several Hesperians were yet unnamed, and these when identified with some Lycænians, would be included in Part 2.—*Nature.*

LARVA OF SESIA DIFFINIS, *Boisd.*—Length 1-5th to 1-7th inches; head slightly retractile, nearly round, apple-green, covered with minute white granulations; mandibles black; body whitish-green above, yellowish-green at the sides, deep black beneath; legs also black; dorsal and lateral regions thickly granulated in transverse lines; first segment with a yellow collar; caudal horn straight and long, black above and beneath, yellow at the sides; spiracles black, all except the first, somewhat encircled with whitish.

Variation of the above.—Head black, body pinkish above, and darker at the sides.

Food plant; the common Snow berry, *(Symphoricarpus racemosus).*

From five larvæ taken Sept. 21st, 1869, in Fayette Co, West Virginia, one imago emerged May 4th, 1870 The above described caterpillars seemed to differ considerably from the description of Morris' *Synopsis.*—THEODORE L. MEAD, New York.

INDIANAPOLIS ACADEMY OF SCIENCES.—We are pleased to learn that a new Scientific Society has been inaugurated at Indianapolis, Ind., under the above designation. As the Corresponding Secretary, Dr. W. W. Butterfield, and one of the Curators, Mr. G. M. Levette, are both entomologists, we may feel sure that our favorite branch of natural history will be by no means neglected.

LIST OF BRITISH INSECTS.—We are glad to see that the Entomological Society of London purpose to publish a general catalogue of the insects of the British Isles. In pursuance of this purpose a catalogue of Neuroptera has just appeared. It is enough to state that it is edited by R. McLachlan, F.L.S., to insure confidence in its accuracy, that gentleman having a reputation in this branch of Entomology throughout Europe, and wherever English books are read. The synonymy is copious and we hope that other portions including other orders will soon follow. Meanwhile we commend this portion to our readers, in the hope that they will encourage the Entomological Society to proceed by spending a shilling for the good of British Entomology whether interested in this special branch or not.—*Science Gossip.*

THE WALSH COLLECTION.—We are gratified to state that our efficient State entomologist, Dr. Le Baron, acting under the advice of Gov. Palmer, has purchased for the use of the state the very extensive cabinet of insects which were collected by the late Benjamin D. Walsh. The price paid for the collection was $2,500 which sum includes the un-paid salary of Mr. Walsh for six months. An order for the money was drawn by the Governor on the contingent fund. The cabinet is temporarily deposited in the fire proof building of the Chicago Academy of Sciences.—*American Entomologist.*

PLATEAU ON THE FLIGHT OF COLEOPTERA.—M. FELIX PLATEAU has supplemented the recent labours of Marey and others upon the flight of insects by examining the movements of the wings of certain Coleoptera. Specimens of the common May-beetle and *Oryctes nasicornis* were selected for experiment. The apparatus used consisted of two pulleys, fastened one above the other, at a distance of two centimeters, on a vetrical support; the upper pulley made twelve turns for each one made by the lower, and could be caused to rotate twenty-four times in a second. The insects

were killed by ether vapor immediately before each experiment; and the wings could be fastened, by a simple contrivance, to the front prolongation of the axis of the upper pulley.

A wing, in its folded state, was fixed on the instrument in such a manner that its plane made, with the plane of rotation, an angle of 45°, as in the living animal. On turning the pulleys, it struck the air obliquely by its upper surface and front margin; but the small diameter of the apparently continuous revolving disc (as indicated by a graduated scale) proved that the wing was still folded, and that centrifugal force had not affected it. When rotation was produced in an opposite direction, so that the wind struck the air both by its posterior membraneous margin and interior surface, the increasing diameter of the disc gave proof of the expansion of the wing, which, indeed, continued to be much extended when motion was arrested. When the plane of a wing was perpendicular to the plane of rotation, and the revolution of the wheel was such that the wing struck the air by its dorsal or upper surface, no extension ensued; when it struck by its lower surface, only partial extension followed. Now the oblique, not the perpendicular plane, is that chosen by nature, and is as has been seen, much more favourable for flight.

On fixing an open wing on the axis so as to make an angle with the plane of rotation, and turning in one direction, the wing remained open; on reversing the direction (*i.e.* acting on the upper surface) it became partially closed.

EXCHANGES, &c.

LEPIDOPTERA.—Canadian Lepidoptera desired in exchange for British. —E. H. COLLINS, *Daily News* Office, Kingston, Ont.

PUPÆ AND OVA OF LEPIDOPTERA.—I am desirous to obtain, if possible, *five* Pupæ and Ova of certain Canadian and other North American Lepidoptera. Would purchase, or give in exchange English or other European species.—CHAS. GEO. ROTHERAM-WEBSDALE, 78 High-street, Barnstaple, England.

COLLECTING TOUR IN WESTERN TEXAS AND NEW MEXICO.—At the request of several gentlemen in this country and Europe, I intend to make an extensive eight or nine months Entomological collecting tour in Western Texas and Southern New Mexico, if sufficient means can be raised. I therefore invite every Entomologist, who wishes to enrich his collection with valuable and unknown species, to assist me in the undertaking. To give everybody a fair chance to get a part of my collections at a limited price, I will divide them into shares at the following rates:

Whole share, $25. Distribution to be from 250 to 500 specimens, in accordance with wishes (Diurnal Lepidoptera and specialities at agreement).

Half share, $12.50. Half the above.

Young collectors or beginners at $5 per 100 specimens.

All sums to be paid in advance.

I shall be obliged by receiving early information from all desiring to subscribe, stating at the same time their wishes. When and where the money is to be delivered, will be notified in due time. No insects will be sold separately after my return, except to subscribers. If anything should happen during the tour to prevent my fulfilling my engagements, or if any one dislikes his share, the money will be refunded. The Coleoptera and Diurnal Lepidoptera will be sent named. Address:—G. W. BELFRAGE, Waco, McLellan Co., Texas (Care of Forsgard & Co).

[We can cordially recommend Mr. Belfrage to our readers as an active and zealous collector: his mounting of specimens is the very perfection of neatness.—ED. C. E.]

ADVERTISEMENTS.

FOR SALE CHEAP.—A fine Oxy-Hydrogen Dissolving-View Apparatus, with Polariscope, Microscope, and Kaleidoscope complete; and a large collection of suitable slides. Apply to E. B. REED, London, Ont.

TEXAN INSECTS.—25,000 specimens of Insects from Texas, for sale or exchange (Reference to ED. CAN. ENT.)—G. W. BELFRAGE, Waco, McLennan Co., Texas. Care of Forsgard & Co.

CORK AND PINS.—We have received a fresh supply from England of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1 to 6, price 50 cents (gold) per packet of 500. Orders will please state whether the package is to be sent by mail or express.

CLUB RATES.—In addition to the Club rates announced on the second page of the wrapper, we are enabled to offer the following:

The American Agriculturist ($1.50), and *Canadian Entomologist* ($1), for $2.
Arthur's Home Magazine ($2), and the *Canadian Entomologist* ($1), for $2.25.
The Children's Hour ($1.25), and the *Canadian Entomologist* ($1), for $1.75.

AGENTS FOR THE CANDIAN ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P. Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, N. Y.

ENGLAND.—Wm. Wesley, 81 Fleet Street, London, E. C. Subscriptions 5s. per Vol.

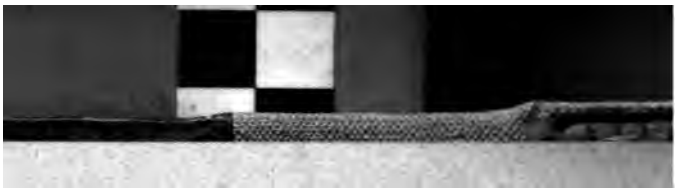
The Canadian Entomologist.

Vol. II. TORONTO, DECEMBER, 1870. No. 12.

OUR THIRD VOLUME.

At the commencement of the year 1870, when relating the improved prospects of the Entomological Society of Canada, we remarked that we had then safely accomplished our first moult, but still continued in a larval state. Most of our readers will no doubt agree with us in the opinion that we were quiescent long enough between the issues of the ninth and tenth numbers of this volume to satisfy the requirements of a pupal state, and that now we may not be thought guilty of presumption when we say that with the first number of our *Third Volume* we expect to come forth in full imago form. We do not intend to burst upon the astonished vision of the Entomological world bedecked with gaudy hues and full of airy lightsomeness, as a gay butterfly in May; but we may perhaps compare ourselves with more propriety to one of those Orthopterous creatures who gradually develope their full powers, without sudden or striking change, and who keep up their larval appetite and tastes to the end. Did we liken ourselves to Lepidoptera, it might be thought that our only office was to sip the sweets of fragrant flowers, and bask for a brief day in the sunshine of prosperity, free from care or thought for the morrow. As Orthopterous, however, we trust that we are of more substantial build, and that, while we gradually increase in size and strength, we may pursue with straight wing the even tenor of our way—borne along on the winds of science, and gathering as we go a full store of contributions, subscriptions, and aid of all kinds.

So much by way of introduction. Let us now briefly state that the THIRD VOLUME of the CANADIAN ENTOMOLOGIST will be printed on toned paper, illustrated with frequent wood-cuts, and enlarged to twenty pages a number. The subscription will continue to be as at present, *one dollar* ($1.25 in U. S. currency) per annum in advance, while subscribers will have the additional privilege of becoming members of "The Incorporated Entomological Society of Ontario," if resident within the Dominion of Canada, or associate members if outside the boundaries of this country. We shall endeavor to issue a number regularly each month, and our aim



will be to make our periodical what a correspondent has been kind enough to designate it already, "concise, scientific and accurate." We are happy to announce that our labours will be lightened and our pages improved by the addition of an Editorial Committee, consisting of Messrs, Saunders, Reed and Denton, of London. The magazine—in consequence of various changes that have been made in the Society in connection with its recent incorporation—will in future be printed and published at London, Ont. All remittances and other business communications should be addressed to the Secretary-Treasurer of the Society, E. BAYNES REED, Esq., London, Ont.; all articles, &c., for insertion, to the general Editor, Rev. C. J. S. BETHUNE, Trinity College School, Port Hope, Ont., or to any member of the Editing Committee.

With this number we close our second volume. On looking back over its pages we cannot refrain from congratulating ourselves upon the measure of success that our little periodical has achieved, though at the same time we are fully conscious of the many failures, shortcomings and imperfections that have occurred during its career. Its chief value has consisted, all will no doubt admit, in its being the means of bringing before the Entomological world the investigations and discoveries of many workers in widely scattered fields; notably among whom we may be permitted to give honorable mention to the name of our warmly esteemed friend, Mr. Wm. Saunders, of London. Our friendly circle of correspondents and contributors—one and all of whom we heartily thank for past favours—will not, we trust, diminish during the progress of the new volume, but will widen out and include the names of many more, till we receive tidings of the Insect world from every Province and State of America, from every county and township of Ontario.

MARCH 29, 1871.

REARING BUTTERFLIES FROM THE EGG.

BY W. H. EDWARDS, COALBURGH, WEST VA.

The results of my experiments with *P. Ajax*, as noticed in Nos. 8 and 9 of the *Canadian Entomologist* (Vol. ii. pp. 115 and 133), are as follows:

From six larvæ obtained from eggs of *Ajax*, deposited in captivity, 16th May, 1870, I obtained two males, four females, *Marcellus*, between 20th and 24th June.

From twenty-four larvæ from eggs of *Ajax* deposited 2nd June, I obtained twelve males, ten females, all *Marcellus*, between 3rd and 9th July, and one chrysalis went over the winter.

From five larvæ from eggs of *Marcellus*, deposited 7th June, I obtained four female *Marcellus* between 4th and 9th July, and one chrysalis went over the winter.

From eighteen larvæ from eggs of *Marcellus*, deposited 2nd July, I obtained fourteen chrysalids, and from these four males, three females, *Marcellus*, between 31st July and 3rd August. One of these chrysalids gave female *Marcellus* on 28th August, several weeks beyond its season, and six went over the winter.

From two larvæ from eggs of *Marcellus* deposited late in August, one yielded in September female *Marcellus*, the other in chrysalis went over the winter.

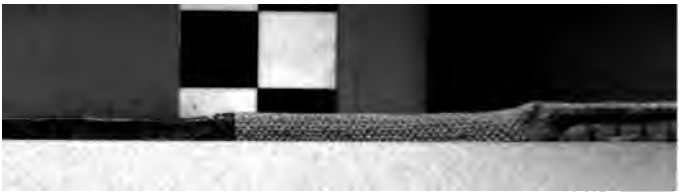
All these that wintered are alive at the date of this writing.

Mr. T. L. Mead, who spent the summer at Coalburgh, raised a large number of larvæ from several black female *Turnus (P. Glaucus)* enclosed in gauze bags on the branches of Tulip Trees, and from these in October we had between 45 and 50 chrysalids. I also obtained several larvæ from *Glaucus* by enclosing the females in a barrel placed over a young tree. We were desirous of seeing the results of breeding from *Glaucus*, and these, when the imagos appear, shall be communicated.

On 2nd June I confined females *Hesp. Pylades*, Scud., in a keg over a plant of *Desmodium Dillenii*, and obtained many eggs. On 4th June, from females *Lycidas* on same plant I obtained eggs. I raised several broods of *Philodice* in same way.

Mr. Mead (July 5) brought in several larvæ of *Melitæa Harrisii*, feeding on *Actinomeris helianthoides*, Nutt. These were of two broods, and some were ¾ inch long, others about ½, all alike, black, covered with spines and with a faint yellow lateral stripe. They seem to require dampness, and I succeeded in bringing one of these to maturity by keeping it confined in a close tin box. The previous year I had lost all my larvæ of this species, which I had attempted to feed in open boxes. The chrysalis resembles in form and markings that of *Phaeton*, though the larvæ differed generically from the larvæ of *Phaeton*. The figure of the larva of *Harrisii* in Packard's Guide is incorrect. Indeed that represents no larva of a butterfly, but of some moth probably.

Sept. 20, Mr. Mead brought in a larva that was quite new to us, generically so, and we thought it might be the coveted *Diana* at last. It was yellow-brown, glossy, with six rows of fleshy spines, all steel-blue in color. Between these spines, in the dorsal rows, white tuberculated spots; the head furnished with two long black spurs like antennæ, jointed, and at the end clubbed. This he found on a black alder resting on a leaf. In three days it refused all food (alder), and remained most of the time when observed motionless, but occasionally was very restless,



evidently hungry. Mr. Mead tried it with several sorts of leaves, among them violet, giving it also a drop of water, which it greedily drank. It soon after began to eat the violet, and being fed on that grew rapidly, and by 25th September had attained a length of 1½ inches. On 1st October it changed to chrysalis, and resembled much in shape that of *Phaeton*, the surface clear pearly colour, partly iridiscent, and covered with metallic bronze tubercles. During my absence from home the last two weeks of October, this chrysalis yielded imago, *Euptoieta claudia*. Boisduval & Leconte pretend to represent this larva, but we did not suspect the species from their figure.

The presence of this larva on alder several feet from the ground indicates that it rests during the day and returns at night to its food plant (violet). It travelled with wonderful rapidity, and a daily journey of ten feet would be a small affair for it. Very likely the larvæ of other Argynnidæ have the same habit, and might be found by beating the bushes near their food-plant rather than by searching the plant itself.

I was not successful this year in obtaining eggs of either of the large Argynnis. In 1869 I succeeded in hatching larvæ of *Diana*, *Cybele* and *Aphrodite*, but one after another fell off the food plant (violet and vernonia) apparently dried up. Dr. Hayhurst, of Sedalia, Mo., to whom I sent eggs of *Diana*, brought one larva to second moult when it also died. I believe this was owing to the dryness of the feeding boxes. The larvæ, in a state of nature, feed on low growing plants in shady, moist situations. Probably feeding in tin boxes kept moist would answer the purpose. The larva of *Euptoieta* seems eager for water, a thing quite new in my experience with any larvæ, and both those of *Argynnis* and *Melitæa* may have the same need.

Coalburgh, W. Va., 27th February, 1871.

NOTE BY ED. C. E.—The above interesting and valuable communication from Mr. Edwards is, we are happy to say, the precursor of many more. In a recent letter he states: "I shall take pleasure in writing pretty regularly to your Journal respecting my own insect breeding, and if other observers will do the same, we can soon get in convenient shape for reference a great deal of information of value to those interested." We trust that this suggestion will be carried out, and that entomologists throughout North America will freely avail themselves of our pages for the recording of their observations in this and other branches of the science.]

ON THECLA INORATA, *G. & R.*, AND THECLA FALACER, *Godt.*

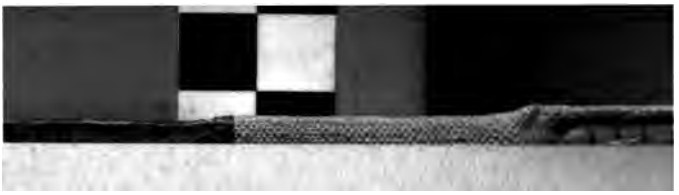
BY AUGUSTUS R. GROTE, DEMOPOLIS, ALA.

In the proceedings of the Boston Society of Natural History, Mr. S. H. Scudder publishes a paper, "On the Synonymy of Thecla Calanus," under date of March, 1870.

Mr. Scudder says: "In Eastern North America there are two species of Thecla, closely allied, occupying, so far as we know, the same geographical area (from Canada to Virginia or Georgia, and from Massachusetts to Iowa), and, until recently, almost invariably confounded by American entomologists. Messrs. Grote & Robinson first called public attention to the fact of their specific distinctness, although Mr. W. Saunders, both in his correspondence and MSS., had previously urged the same point. As my material was insufficient, and because certain specimens to which I had constant access seemed to combine many of the features which generally separated the specimens into two groups, I have hitherto been unwilling to accept the determinations of these Entomologists. But recently, through the kindness of many friends, I have had the opportunity of examining more than one hundred specimens of each species, and have become entirely convinced of their specific value."

Mr. Scudder then goes on to say: "The most prominent points of distinction between the two species are to be found in the general tint of the upper and under surfaces of the wings, in the presence or absence of orange spots near the anal angle of the secondaries, and in the nature of the extra mesial band upon the under surface."

These points of distinction between the two species, *Thecla inorata*, G. & R., and *Thecla calanus*, Hubner, *spec nobis*, we had previously urged in separating the two species, with the exception that we availed ourselves of no character drawn from the extra mesial band of the under surface in so doing. Mr. Scudder is more fortunate in this respect, and finds "most striking differences between the species" in the character offered by the extra mesial band of the under surface. From a perusal of Mr. Scudder's paper, it might be inferred we had, in separating the species, entirely overlooked the point. Yet this is not the case. In our first paper on the subject we discuss the aspect of this extra mesial band in the closely allied species of *Thecla* belonging to this group. In the Transactions of the American Entomological Society, page 173, August, 1867, we say:—*T. falacer*, Harris, Ins. Inj. Veg. p. 276, may be assumed as a synonym of *T. calanus*, since, while the "orange colored spot" of the secondaries above is mentioned, "there are two rows of spots bordered on one side only with white," crossing the wing beneath. This latter character would hardly apply to *acadica*, the only other species to be here



considered, since the inner discal band is here completely macular; and though in *T. calanus* this band or row of dark brown spots is also, but more faintly edged inwardly by a white line, we may assume that this inner edging, always fainter and sometimes wanting on the primaries (*T. calanus* and *T. falacer*), always wanting on the primaries, and in one specimen on the secondaries (*T. inorata*) is not sufficiently constant to afford a specific character. While Harris' *T. falacer* cannot be referred to *Thecla falacer*, Godt, *sp.*, as illustrated by Boisd. Lec., it is probable that his specimens are to be referred to *T. calanus* rather than to *T. acadica*.

It may be here remarked that our conclusion as to Harris' specimens turns out to be correct, for Mr. Scudder refers them in this same paper to *T. Edwardsii*, which is the same as T. *calanus nobis*.

Mr. Scudder further finds that the distinctive character found in the orange spots of the upper surface of the secondaries only to be of relative value, since specimens of *T. inorata* have occurred with these spots, and of *T. calanus* without them, the reverse having been assumed by ourselves in our former papers as the fact. It is, however, quite clear that these spots are the rule with *T. calanus*, the exception with *T. inorata*.

With respect to the synonmy of the two species to be separated, Mr. Scudder differs remarkably from ourselves.

He considers Hubner's figure of *calanus*, which agrees in both sexes with our *T. calanus* in its slightly greater expanse as compared with *T. inorata* its more brownish color, and in the very distinctly orange spotted secondaries above, as representing *Thecla inorata*, and this mainly from the character of the extra mesial band.

Mr. Scudder says: "The color of the under surface in no way resembles that of *Edwardsii* (*T. calanus nobis*), and is precisely the same as *calanus* (*T. inorata nobis*): a small orange spot painted near the anal angle of the upper surface of the secondaries in both sexes, occurs more frequently in *Edwardsii*, but is by no means absent from *calanus*.

And further: "The orange lunule of the under surface is given rather as it usually occurs in *Edwardsii*, than as in the *calanus*, but is not very common in the latter; and finally, the sexual patch on the upper surface of the primaries of the male is as in *calanus*. That the extent of the coloring is faulty is shown by several features in which it exaggerates either species, and only when doing so does it approach *Edwardsii* rather than *calanus*; in all features of pure delineation it resembles only *calanus* so that there can be no possible doubt that Grote and Robinson's *inorata* is the same as Hubner's *calanus*.

If Mr. Scudder is right, then the species he calls *Thecla Edwardsii* must be called *Thecla falacer*, Godart. The question of the synonymy

of these species was fully in our mind when we visited Dr. Boisduval in Paris. In the collection of this savant is the typical specimen of Godart, and it is a specimen of *Thecla calanus, nobis*, for which we have used the name of *Thecla Edwardsii* as a synonym. But we are by no means satisfied that Mr. Scudder is right. Opinions may well differ as to a figure without description, which even Mr. Scudder finds faulty. It may be said with equal justice that Hubner's figure represents *T. calanus, nob. (T. Edwardsii)*, and only where it is defective does it approach *T. inorata (T. calanus*, Scudder).

The chances are also against Hubner's having figured both sexes of the usually unspotted *T. inorata* with the spotted secondaries of *T. calanus, nob.* Leconte has certainly figured *T. inorata*, and as we stated before, Boisduval has used the specimen of Godart's *T. falacer (T. Edwardsii*, Saund.), while furnishing the text. Boisduval considered Leconte's plate as representing a form of *T. falacer*, Godart, and erroneously so, as Leconte figured for the first and only time *Thecla inorata*; Mr. Scudder's version of Hubner's plate to the contrary notwithstanding. We are at a loss to understand Mr. Scudder's remark, that we have come to an "erroneous conclusion respecting Boisduval and Leconte's plate, which, bad as it is, can certainly only represent *calanus*," (i. e. *T. inorata*). With the exception of the stricture, this accurately represents our published opinion with regard to that plate.

Dr. Boisduval cited Hubner's *calanus* in the text to *T. falacer*, because he considered, and in our opinion correctly, that Hubner's figure represented Godart's species, which latter he had before him. But that he mistrusted both Hubner's and Leconte's figures is very evident. He preferred Godart's later name and used his type.

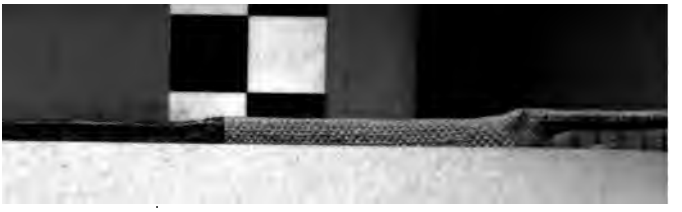
With respect to the citations of Mr. Scudder, under the synonymy of the two species, there is much that is unnecessary as well as erroneous. Any reference to such an inaccurate compilation as that of Mr. Weidemeyer is a work of supererogation in a matter like the present. Leaving Hubner's figure on one side, we have Godart and Harris's description of *Thecla falacer*, and our own of *T. inorata* to fall back upon, so that the certain determination of the two species with all necessary citations is as follows:

THECLA INORATA:

Thecla inorata, G. and R. Descrip. Am. Lep. No. 3, p. 1, January, 1868.
Thecla falacer, Boisd. Lec. plate xxix., figs 1-5.
Thecla inorata, Saund. Can. Ent., Vol. II., 61-64; G. and R. Trans. Am. Ent. Soc. I. 172-3.

THECLA FALACER:

Thecla falacer, Godart Encyc. ix. 600, 633; Boisd. Lec. (text in part); Harris, Treat. Ins. Veg. Ed. 1862, 276.
Thecla Edwardsii, Saunders i. Litt. G. and R. Trans. Am. Ent. Soc. I. 172
(?) *Rusticus armatus calanus*, Hubner, Exot. Schm. i., figs. 1-4.
Thecla calanus, Westw. Gen. Diurn. Lep. II., 486; G. and R. Trans. Am. Ent. Soc. I. 172-3.



We omit purposely all references to Mr. Scudder's notices of these species. Two brief notices of the occurrence of *T. falacer* in New England preceded the paper in the Boston proceedings noticed, and to which the present is a reply.

With respect to the geographical distribution of the two species, while occurring side by side in the Atlantic District, it is probable that *Thecla inornata*, already found from Canada to Georgia, may be found over a wider expense of territory than *Thecla falacer*.

Demopolis, Ala., December, 1870.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 145).

67. TRECHUS [BRADYCELLUS] TIBIALIS, *Kirby.*—Length of body 2¼ lines. Only a single specimen taken.

[47] Body black, somewhat glossy. The tip of the palpi and scape of the antennæ are rufous; the prothorax is rather wider than long, but nearly square; the short basilar furrows observable in *Argutor* distinguish this species from the succeeding ones: elytra lightly furrowed, furrows impunctured; in the usual situation adjacent to the second furrow a little beyond the middle of the elytrum a very minute punctiform impression is just discernible; the lateral margin and suture at the apex of the elytra are reddish: the tibiæ are rufous but the cubit is black at the tip; the tarsi are darker, the hand has four dilated joints as in the other species of the genus.

[Belongs to *Bradycellus*; for a synopsis of the N. Amercan species by Dr. LeConte, *vide* Pro. Acad. N. S. Phil., Dec., 1868, p. 379.]

68. TRECHUS [BRADYCELLUS] RUFICRUS, *Kirby.*—Length of body 2⅓ lines. Only one specimen taken.

Body black, glossy. Palpi piceous; scape of the antennæ and mouth rufous: prothorax subobcordate; chanelled, channel not abbreviated, margin rufous especially the basilar; angles rounded; basilar impressions single, round and punctured: elytra lurid or dirty yellow, with a large blackish cloud or blotch beyond the middle: legs dull rufous, thighs darker. [Included by LeConte, *loc. cit.*, under *B. badiipennis*, Hall, a species taken at Grimsby, Ont., by Mr. Pettit.]

69. TRECHUS [BRADYCELLUS] FLAVIPES, *Kirby.*—Length of body 2⅓ lines. Many taken in Lat. 54°.

[48] Body piceous, glossy. Head underneath, nose, mouth, and oral organs—except the palpi which are pale yellow—and antenna rufous;

three first joints of the latter paler than the others: prothorax rufous, rather longer than wide, between square and obcordate; basilar impressions single, very slight, punctured, and black; elytra rufous, with a broad black stripe adjoining the suture and parallel with it; furrows rather deep, impunctured: legs pale yellow.

N.B.—In the majority of specimens the black stripe of the elytra is very faint, and in some evanescent, and the impressions as well as the rest of the prothorax rufous. [Previously described as *B. rupestris*, Say. —Ent Works ii. 505. Very common in Canada.]

70. TRECHUS IMMUNIS, *Kirby*.—Length of body 1¾ lines. Two specimens taken with the preceding species.

Similar to *T. flavipes* but smaller, the nose is piceous, the thorax is more dusky; dorsal channel indistinct; basilar impressions deeper and impunctured; elytra dark piceous with merely the bead of the lateral margin rufous; the furrows also are more lightly drawn: legs darker. [Le Conte, *loc. cit.*, states that he has not identified this species, but that it is perhaps *Stenolophus carus*, Lec., though the description is scarcely sufficient to warrant the placing of the latter in synonymy.]

71. TRECHUS [BRADYCELLUS] SIMILIS, *Kirby*.—Length of body 3¼ lines. Two specimens taken in Lat. 54°.

Body black, glossy. Mouth reddish-yellow; palpi yellow; upper-lip and mandibles rufous, the latter black at the tip; antennæ dusky-rufous, three first joints more yellow; prothorax between obcordate and square, with the whole of the base distinctly and grossly punctured; basilar impressions shallow; limb of the prothorax is reddish-yellow, the disk is occupied by a large square black spot: the suture, lateral margin, and apex widely, and the inner base of the elytra, are reddish-yellow; [49] adjoining the suture is a broad black stripe not reaching the apex; the furrows are rather deep and impunctured; and in the usual situation, a little beyond the middle, a punctiform impression is adjacent to the second furrow; the sides of the fore-breast, the anus and the legs, are reddish-yellow.

Var. B. Thorax without a black spot in the disk, body underneath piceous.

[Previously described as *Feronia atrimedius* by Say.—Ent. Works ii. 466.]

[50] 72. ISOPLEURUS NITIDUS, *Kirby*.—Plate i. fig. 6. Length of body 3¼ lines. A single specimen taken in the Rocky Mountains.

Body very glossy, underneath rufo-piceous, above bronzed with a light tint of piceous. Upper-lip rufous; palpi, antennæ which are slender, side-cover of the elytra and legs reddish-yellow: prothorax rather wider than long, punctured posteriorly, basilar impressions doubled:

furrows of the elytra slightly punctured, at the apex impunctured. [Placed in Le Conte's List, p. 10, with a mark of interrogation, under *Amara septentrionalis*, Lec., and with the note that the name has been previously employed for another species.]

[51] 73. PATROBUS AMERICANUS, *De Jean*.—Three specimens taken in Lat 54°. Length of body 5¾ lines.

[Previously described as *Feronia* (*Patrobus*) *longicollis*, Say.; not uncommon in Ontario. For description *vide* Say's Ent. Works, ii. 466.]

[52] 74. PERYPHUS [BEMBIDIUM] BIMACULATUS, *Kirby*.—Length of body 3¼ lines. Taken in lat. 65°.

Body glossy, underneath black, above black-bronzed with a slight greenish tint. Head triangular, with a thick convex neck; frontal impressions long and deep; antennæ longer than the prothorax, third joint of the length of the succeeding ones; scape and palpi rufous; prothorax obcordate convex, at the base depressed, constricted and grossly punctured; dorsal channel as in *Patrobus*; basilar impressions single, round and deepish; elytra slightly furrowed, with the furrows punctured; the seventh from the suture nearly obliterated; apex nearly smooth, near which is an oblique pale spot; legs rufous with darker thighs, especially in the middle.

N. B.—When the elytra are raised from the body, they are dusky-bronzed. [The old genus *Peryphus* is included by Le Conte as a group under *Bembidium*, Pro. Acad. N. S. Phil. 1857, p. 3.

75. PERYPHUS [BEMBIDIUM] SORDIDUS, *Kirby*.—Length of body 3 lines. A single specimen taken in lat. 54°.

This so nearly resembles *P. bimaculatus*, that I first put it aside as an immature specimen, but further consideration induces me to consider it as distinct. It is wholly pale rufous, except the head, the prothorax and the anus: the three first joints of the antennæ and the base of the fourth are also rufous: the prothorax appears rather narrower in proportion, and less distinctly punctured at the base; the spot at the apex of the elytra is larger, and the thighs are rather slenderer.

[53] 76. PERYPHUS [BEMBIDIUM] SCOPULINUS, *Kirby*.—Two specimens, taken in lat. 54°. [Previously described as *B. postremum*, Say, Ent. Works, ii. 561].

77. PERYPHUS [BEMBIDIUM] RUPICOLA, *Kirby*.—Taken abundantly in lat. 54° and 65°. Length of body 2½ lines.

This little species appears to be the American representative of *P. littoralis*, which in many respects it closely resembles. It is, however, a smaller insect. The body is invariably piceous or rufo-piceous, and the head and prothorax are of the same color, bronzed; the antennæ are

ferruginous, with the scape paler; the prothorax is rather shorter. [Included in Le Conte's List as a variety of *B. rupestre*, Dej., *tetracolum*, Say, Ent. Works, ii. 503].

[54] 78. PERYPHUS [BEMBIDIUM] PICIPES, *Kirby*.—Length of body 2¼ lines. Two specimens taken in lat. 65°.

Body black, glossy, above scarcely at all bronzed. First joint of the antennæ rufo-piceous; sculpture of the head, prothorax and elytra precisely that of the preceding species of the genus; elytra unspotted, with two punctiform impressions situated as in *P. scopulinus*, &c.; legs rufo-piceous. This comes very close to *P. nitidulus*, but that species has no punctiform impressions, and the legs are of a different colour.

79. PERYPHUS [BEMBIDIUM] CONCOLOR, *Kirby*.—Length of body 2½ lines.

Body and members black, glossy, above bronzed. Scape of the antennæ piceous; prothorax less constricted behind than in *P. picipes*; space between the basilar impressions impunctured; elytra more deeply furrowed with larger punctures in the furrows; the lateral furrows are not obliterated, but the apex of the elytrum is impunctured. [A species unknown to Le Conte.]

80. PERYPHUS [BEMBIDIUM] QUADRIMACULATUS, *Linn.*—Two specimens in lat. 54°. [Subsequently described as *B. oppositum*, Say.—Ent. Works, ii. 501; taken in Canada.]

[55] 81. PERYPHUS [BEMBIDIUM] NITIDUS, *Kirby*.—Plate i. fig. 7. Length of body 3½ lines. Two specimens, taken lat. 54°.

Body linear-oblong, subdepressed, very glossy, underneath black, above black-bronzed. Head triangular; frontal impressions long and rather curvilinear; scape of the antennæ rufous underneath; prothorax nearly square, and level with curving sides; dorsal channel nearly obsolete; basilar impressions double, the inner one round and rather deep, the other very slight, with a little ridge between it and the margin; anterior and posterior margin nearly straight; elytra with sides nearly parallel as well as the apex impunctured; a quintuple series of punctures adjoins the suture, which extends very little beyond the half of the elytrum, with traces of slight furrows beyond it. [Taken in Canada; a specimen in our collection from Mr. B. Billings, Ottawa, Ontario; at Fort Simpson, Mackenzie River, by Mr. Kennicott; and in the Platte River Valley, by Dr. Le Conte].

[56] 82. TACHYTA PICIPES, *Kirby*.—Plate viii. fig. 6. Length of body 1⅛ lines. Four specimens, taken in lat. 54°.

Body black, glossy. Frontal impressions rather oblique; eyes less prominent than usual in the tribe; prothorax broader than long, subobcordate; basilar impressions, which are single, and dorsal channel, rather deep; elytra with three obsolete impunctured furrows next the suture, which do not reach the apex. Apex rounded; legs piceous. [Previously

described as *Tachys nanus*, Schaum, and *Bemb. inornatum*, Say.—Ent. Works, ii. 502; taken in Canada.]

[57] 83. NOTAPHUS [BEMBIDIUM] NIGRIPES, *Kirby*.—Length of body 2 lines. Three specimens, taken in lat. 54°.

Body black, glossy; above bronzed with a greenish tint; the whole upper surface, under a powerful magnifier, appears covered with innumerable granules, which are much more distinctly seen in this family than in the *Peryphidæ*. Scape of the antennæ, which are longer than the prothorax, rufo-piceous; frontal impressions parallel; the punctiform impression adjoining the eyes on their inner side has a central elevation: prothorax short, with a deep dorsal channel; basilar impressions double, with a little ridge between the external one and the margin: elytra furrowed; furrows punctured for about two-thirds of their length; the first and second reach the apex, where they are confluent; the third and fourth stop a little short of the apex, and are also confluent, as are the fifth and sixth, which are still shorter, and terminate in a little furrow common to both; the seventh and eighth reach the apex, where they likewise unite; two punctiform impressions in the usual situation, adjoin the third furrow; at the base of the elytrum, in the interstice between the fifth and sixth furrows, is a longitudinal lurid streak, then follows an abbreviated and articulate band of the same colour, consisting of four streaks, those near the lateral margin being much the longest; in the interstices between the second and third furrows are two such little streaks; near the apex is likewise another band, both articulated and undulated, consisting of seven spots, the marginal one being rather the longest; the tips of the elytra are likewise lurid.

N. nigripes is related to *N. ustulatus*, and appears to be its American representative; it differs from it in having black legs, and the lurid markings of the elytra are different: it comes nearest to Gyllenhal's Variety C. [*Vide* Pro. Acad. N. S. Phil., July, 1860, p. 316.]

[58] 84. NOTAPHUS [BEMBIDIUM] INTERMEDIUS, *Kirby*.—Length of body 1¾ lines. A single specimen, taken in lat. 54°.

Very nearly related to *N. nigripes*, but the head and prothorax are greener; antennæ as long as the prothorax; the palpi are rufous with the penultimate joint rather dusky; elytra bronzed-lurid, with a round black spot near the base, a larger near the apex, and an angular band of the same colour between them; the legs are dull rufous. The sculpture of the elytra is nearly the same as in that species, but the fifth furrow, by a turn outward, almost intercepts the sixth and seventh, and then runs to the apex of the elytrum; the furrows themselves are black.

85. NOTAPHUS [BEMBIDIUM] VARIEGATUS, *Kirby*.—Length of body 1¾ lines.

This also is related to *N. nigripes*, but it is quite distinct. The head and prothorax are without any green tint; the antennæ are not longer than the prothorax; the prothorax is proportionally not so wide before and narrower behind: elytra scarcely at all bronzed; lurid with a large blackish cloud or spot near the base, another near the apex, and an intermediate black angular band; the furrows of the elytra, especially the external ones, do not reach the apex, or at least are obliterated; they are punctured the whole of their apparent length; instead of two, there are three punctiform impressions; the legs are rufo-piceous. [This name is preoccupied by Say's species; Le Conte considers Kirby's species synonymous with *B. versicolor* Lec.]

[59] 86. BEMBIDIUM IMPRESSUM, *Gyll.*—Length of body 2⅛ lines. Taken frequently in lat. 54° and 60°, and in the journey from New York to Cumberland-house. On the sandy shores of Lake Winnipeg, in the spring of 1825 (Mr. Drummond). In Canada (Dr. Bigsby).

[60] Body underneath green, bronzed, very glossy; above bronzed, gloss much obscured, occasioned by an infinity of most minute reticulations, visible only under a good magnifier, which give it a granulated appearance; frontal impressions and ocellated punctures as in *Notaphus;* eyes very large and prominent; palpi bronzed, with the second joint obscurely rufous; antennæ longer than the prothorax, with the scape and the base of the second and third joints rufous; prothorax short, depressed both at the base and apex, the depressed part being wrinkled longitudinally; dorsal channel and basilar impressions rather deep; in the latter are two little furrows; in the elytra, a little beyond the middle, in the interstice between the second and third furrows, are two quadrangular, oblong, slightly depressed spaces, of a somewhat golden lustre, and marked at the anterior end with a punctiform impression; immediately before, between, and after the depressed spaces, is a levigated and rather elevated one of the same shape; the furrows of the elytra are arranged nearly in the same way as those of *Notaphus intermedius*, above described: the legs are rufous, with the thighs bronzed at the apex. [Taken in Canada.]

Genus OPISTHIUS, *Kirby*.

Oral organs scarcely different from those of *Elaphrus*.

Body depressed and flat. *Head* triangular, antennæ much more slender and longer than those of *Elaphrus*, 3rd joint rather longer than 4th. *Prothorax* very short, transverse, scarcely wider than the head; anteriorly obsoletely obtus-angular, posteriorly subrepand, depressed a little at base and apex; channelled, but without basilar impressions;

sides gibbous; angles all obtuse. *Scutellum* rather obtus-angular. *Elytra*, alitrunk,* and abdomen very much dilated, nearly twice the width of the prothorax, without furrows, with several rows of obsolete mammillated impressions. *Legs* rather longer and more slender than those of *Elaphrus*; the *hands* of the male have the first four joints a little dilated and furnished underneath with a brush.

[61] 87. OPISTHIUS RICHARDSONII, *Kirby*.—Plate i. fig. 9. Length of body 4¼ lines; breadth of prothorax 1 line; of elytra taken together 2⅝ lines. Mr. Drummond, from my description of this curious insect, thinks it was taken in May, 1825, on an island of Lake Winnipeg, frequenting moist muddy places from which the water had shrunk.

Body with the gloss obscured; underneath black, somewhat hairy, above a little bronzed. Antennæ nearly half the length of the body, first four joints greenish-bronzed, the rest deep blue; front with a slight impression between the antennæ and a few scattered short whitish hairs: prothorax very short, more bronzed, transversely very minutely wrinkled: elytra with three rows of oblong greenish very slight impressions, each with a central oblong elevation, with another levigated one between each; adjoining the lateral margin in a fourth series of greenish-bronzed more numerous impressions without any central or intermediate elevations: thighs green-bronzed, tibiæ obscurely rufous, tarsi black, legs hairy. [Taken at Fort Simpson, Mackenzie River, by Mr. Robert Kennicott.]

88. ELAPHRUS CLAIRVILLII, *Kirby*.—Plate i. fig. 8. Length of body 4 lines. A single specimen taken in the journey from New York to Cumberland-house.

[62] Body glossy; underneath green-bronzed; above black slightly bronzed, covered with minute scattered, gilded punctures. Mandibles and palpi piceous; antennæ black, with the three first joints dark blue; front with an elevation between the eyes, rather deeply impressed in the centre: prothorax longer than wide, uneven, with two large discoidal elevations separated by a dorsal channel, each with a central impression; a single basilar impression at the posterior angles tinted with blue: elytra with four irregular rows containing in all twenty-one slight circular impressions punctured, and tinted with blue, each, except the marginal ones surrounded by an elevated ring, and placed in a wider impression; between each of these impressions in the two first rows is an elevated and levigated space: thighs glossy-green, the posterior pair rufous at the base; tibiæ and tarsi piceous.

I am doubtful whether this species may not be Mr. Say's *E. riparius*, but it is not the real one, from which, and *E. uliginosus*, it is distin-

*The alitrunk is that part which bears the wings and the four posterior legs.

guished by being much less thickly dusted with green-gold glittering punctures, which gives it a blacker hue. The impression also in the elevated space between the eyes is much deeper. The blue-tinctured impressions of the elytra are also more distinct, and surrounded by a more elevated ring. [Taken on the Island of Toronto by Mr. Couper, *Can. Journal*, 1856, p. 33.]

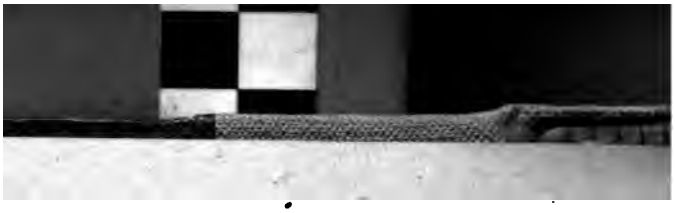
89. ELAPHRUS INTERMEDIUS, *Kirby*.—Length of body 4 lines. Taken by Dr. Bigsby in Canada.

This species resembles *E. cupreus*, but it is quite distinct. The body is more thickly and minutely punctured on the whole upper surface; underneath it is of a fine bronzed-green; above it is blacker and less brilliant; the head is greenish; the middle space between the eyes is less elevated than in that species, and wrinkled longitudinally without any impression: the impressions on the discoidal elevations of the prothorax are fainter: the elytra like the other species have a quadruple series of impressions, but they are broader, more slight, without any elevated ring, are more minutely punctured, have a slight elevation in the centre, and are of the same colour with the rest of the elytrum; the marginal series is nearly obsolete: just before the middle, adjoining the suture is a quadrangular elevation which unites with that of the other elytrum: the thighs are green, rufous at the base, tibiæ rufous, tarsi piceous. [Taken in Canada.]

[63] 90. ELAPHRUS OBSCURIOR, *Kirby*.—Length of body 3¼ lines. A single specimen taken in Lat. 65°.

This species is more strongly marked than the majority of the *Elaphri*. On the underside the head and trunk are copper with a slight tint of green; the abdomen of a dusky purplish copper: above it is copper-coloured; the head, with the exception of the upper-lip, is very thickly and confluently punctured, with a levigated but scarcely elevated space between the eyes; the first four joints of the antennæ are cupreous: prothorax not wider than the head, confluently and thickly punctured; discoidal elevations not conspicuous nor impressed; elytra not glossy, punctured with scattered punctures, marked by a quadruple series of very slight impressions, some nearly obsolete, most of them marked out by a very slight elevated ring and a circle of punctures, three levigated quadrangular spaces near the suture, and arranged in a line parallel with it, and a fourth triangular one removed from it, near the apex; the disk of the elytra is faintly purple: legs bronzed.

91. NOTIOPHILUS AQUATICUS, *Linn*.—One specimen taken. [An erroneous determination, according to Dr. LeConte, who considers it to be *N. semistriatus*, Say. For description, which very closely corresponds with Kirby's, *vide* Say's Ent. Works, ii. 497.]



[65] 92. OMOPHRON SAYI, *Kirby*.—Taken by Dr. Bigsby in Canada. Length of body 3½ lines.

This species seems intermediate between *O. limbatum* and *O. labiatum*. From the former it differs in having a much fainter tint of green on the darker parts of the body; in its black prothorax with silvery sides as well as margin. From the latter in having the lateral furrows as deep and distinctly punctured as those of the disk; and, instead of two reddish spots near the base of the elytra, having two angulato-undulated bands, one near the base and the other beyond the middle, and the tips testaceous; all connected by the margin of the same colour. It seems to have escaped the describers of *O. Limbatum* that the upper-lip and lateral margin of the prothorax and elytra are likewise silvery, though not so conspicuously as in *O. Labiatum* and *Saii*.

The sculpture of the elytra in this genus, as well as in *Calosoma*, differs from that of the other terrestrial predaceous beetles in having more than nine furrows, which appears to be the typical number in the section. [Synonymous with *O. Americanum*, Dej.; taken in many parts of Canada.]

[*End of the* CARABIDÆ.]

LEPIDOPTEROUS LARVÆ FIGHTING;

AND TENACITY OF LIFE IN LARVA OF CLISIOCAMPA SILVATICA.

BY HENRY L. MOODY, Malden, Mass.

On returning from a collecting tour, one day in last June, I emptied my larvæ box, putting in a collar box for a short time a larvæ of *C. Silvatica*, one of the Geometrid and one other Lepidopterous larva: the two last I could not identify, but they were *all* Lepidopterous. I did not open the box until three or four hours afterwards, when I found a decided change in the appearance of my larvæ. The *C. Silvatica* larva was bitten entirely apart, the head and three first segments being in one piece, the three last abdominal segments in another; the remaining segments were in an indistinguishable mass on the bottom of the box. The geometrid larva was in almost as bad condition, but was not bitten apart; the third was uninjured.

I have always supposed Lepidopterous larvæ incapable of seriously injuring each other, and have never heard or read of their doing so. I have often seen them bite at each other quite spitefully, but their bite seemed to be harmless. But here is surely an instance of decided and continued pugnacity; for to have inflicted the amount of injury that each received

must have required some time, and the appearance of the larvæ certainly indicated that they did not give up the struggle until obliged to from weakness.

An equally surprising circumstance to me was the tenacity of life in the *C. Silvatica* larva. When I opened the box, the fluids from their bodies were thoroughly dried on the bottom of it, showing that they must have had their quarrel at least an hour before; yet the piece of the C. S. larva, consisting of the head and three first segments, was quite active. I placed it on my table and watched its movements. It moved at the rate of two inches in three minutes, moving in a direct line. When we consider that it had only left six legs out of sixteen, we must say that it was doing very well. I then placed it on its back, and it moved its legs freely, and made an effort to turn over on its feet. I also noticed that it moved its jaws freely.

What I have related, both in regard to the larvæ fighting, and the tenacity of life, was to me very surprising, but your readers may know of other similar instances. I should like to hear from them on the subject.

THE INCORPORATED ENTOMOLOGICAL SOCIETY OF ONTARIO.

A general meeting of the Entomological Society of Canada was held in the Rooms of the Canadian Institute, Toronto, on Thursday morning, March 2nd, 1871. E. Baynes Reed, Esq. (London), Vice-President, occupied the chair. A goodly number of members were present, including several from the London Branch of the Society.

The minutes of the last meeting, and the Report of the Committee on the Cabinet for the Agricultural and Arts Association, were read and adopted.

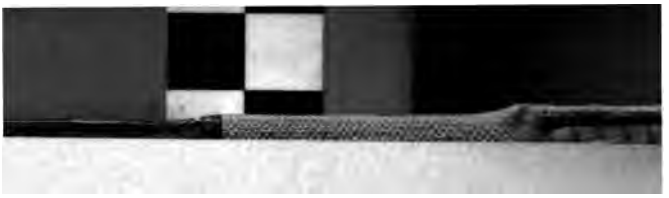
Letters were also read from Prof. Hincks, Messrs. Couper, Cowdry and Websdale.

The application of certain gentlemen, at Kingston, Ont., who desire to form a Branch of the Society there, was read, and on motion laid over to the afternoon meeting for consideration.

Mr. Reed read the correspondence with the Bureau of Agriculture of Ontario, and gave a statement of the proceedings that had taken place with reference to the incorporation of the Society. He also read the "Act to amend the Agricultural and Arts Act," which had been passed at the recent session of the Legislature, and which included provisions for the incorportion of the Society.

It was then moved by Mr. Wm. Saunders, seconded by the Rev. C. J. S. Bethune,

That the Entomological Society of Canada gladly avails itself of the benefits arising from the liberality of the Government of Ontario, as set



forth in the amended Agricultural Act; and that the meeting do now proceed to comply with the requirements of the Act of Incorporation.—*Carried.*

Mr. Saunders then gave notice that at the next meeting of the Society he would move that the Constitution be amended so as to bring it into accordance with the Act of Incorporation. The meeting then adjourned.

AFTERNOON MEETING.

A second meeting of the Society was held, pursuant to notice, at 3 o'clock, P.M., on the same day as the preceding, and at the same place.

The President, Prof. Croft, occupied the chair. The minutes of the previous meeting were read and adopted.

In accordance with the notice of motion given by Mr. Saunders at the former meeting, the Constitution of the Society was taken up for discussion, and amended in accordance with the provisions of the Act of Incorporation. [We shall publish the Act and the Constitution as amended in our next number.—ED. C. E.]

The following gentlemen were elected to hold office for the ensuing year:—

PRESIDENT—Rev. C. J. S. Bethune, Trinity College School, Port Hope.

VICE-PRESIDENT—W. Saunders, Esq., London.

SECRETARY-TREASURER—E. Baynes Reed. Esq., London.

DIRECTORS—Prof. Croft, University College, Toronto; J. M. Denton, Esq., London: and R. V. Rogers, Esq., jun., Kingston.

AUDITORS—J. H. Griffith, Esq., and C. Chapman, Esq., London.

The following gentlemen were elected members of the Society:—A. B. Bennett, Esq., Brantford, Ont., and D. W. Beadle, Esq., St. Catharines, Ont.

The application from Kingston, for the formation of a Branch of the Society there, laid over from the previous meeting, was received, and permission was granted to establish a Branch, in accordance with the terms of the Constitution of the Society.

After some discussion, it was resolved that Art. I. sec. ii. of the Constitution be held in abeyance till the next annual meeting of the Society, and that in the meantime any person be admissible as an ordinary or associate member on payment of one dollar. The annual subscription of members, entitling them to a copy of the *Canadian Entomologist* and all other publications of the Society free of charge, had been previously reduced in the amended Constitution to one dollar per annum. Any one, therefore, sending this amount to the Secretary-Treasurer can become a member of the Society at once.

It was resolved to transfer the printing and publication of the *Canadian Entomologist* to London, to increase its size, and issue it in a much more attractive form, embellishing its pages with suitable illustrations. The Rev. C. J. S. Bethune was unanimously requested to

continue to act as Editor, and Messrs. Saunders, Reed and Denton were appointed a Committee to assist him in the work. The sum of one hundred dollars per annum was also voted to be paid to the Editor from the Society's funds.

The following was also adopted: "That the hearty thanks of this Society are tendered to the Rev. C. J. S. Bethune, for his untiring zeal and activity while holding the office of Secretary-Treasurer during the last eight years."

The meeting then adjourned.

MISCELLANEOUS NOTES.

COLIAS PHILODICE.—I suspect that at least two species are passing under the name of *Colias Philodice*. I bred from the egg several larvæ last season that differed in important respects from those I had before bred in like manner, and which last agreed with Mr. Saunders' description in Vol. I., CAN. ENT., p. 54. In the first named, on each segment, beneath the white lateral stripe, was a black spot, semicircular, and conspicuous. Mr. Saunders makes no mention of these spots, nor had I before observed them on other larvæ. The imagos from these larvæ are of one of the peculiar varieties, or what has been considered as such, of *C. Philodice*. The species is known to vary widely, but some of the supposed varieties are extreme—almost too much so to be considered varieties, unless proved to be so by actual breeding from the egg.—W. H. EDWARDS, West Va.

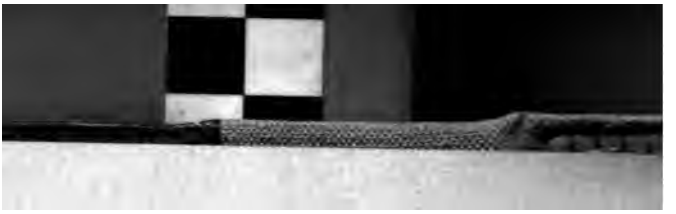
Jan. 27, 1871.

EXCHANGES, &c.

LEPIDOPTERA.—Canadian Lepidoptera desired in Exchange for British.—E. H. COLLINS, *Daily News* Office, Kingston, Ont.

PUPÆ AND OVA OF LEPIDOPTERA.—I am desirous to obtain, if possible, *live* Pupæ and Ova of certain Canadian and other North American Lepidoptera. Would purchase, or give in exchange English or other European species.—CHAS. GEO. ROTHERAM-WEBSDALE, 78 High-street, Barnstaple, England.

COLLECTING TOUR IN WESTERN TEXAS AND NEW MEXICO.—At the request of several gentlemen in this country and Europe, I intend to make an extensive eight or nine months Entomological tour in Western Texas and Southern New Mexico, if sufficient means can be raised. I therefore invite every Entomologist, who wishes to enrich his collection with valuable and unknown species, to assist me in the undertaking. To give everybody a fair chance to get a part of my collections at a limited price, I will divide them into shares at the following rates:—



Whole share, $25. Distribution to be from 250 to 500 specimens, in accordance with wishes (Diurnal Lepidoptera and specialties at agreement).

Half shares, $12 50. Half the above.

Young collectors or beginners at $5 per 100 specimens.

All sums to be paid in advance.

I shall be obliged by receiving early information from all desiring to subscribe, stating at the same time their wishes. When and where the money is to be delivered, will be notified in due time. No insects will be sold separately after my return, except to subscribers. If anything should happen during the tour to prevent my fulfilling my engagements, or if any one dislikes his share, the money will be refunded. The Coleoptera and Diurnal Lepidoptera will be sent named. Address:—G. W. BELFRAGE, Waco, McLennan Co., Texas (Care of Forsgard & Co.)

(We can cordially recommend Mr. Belfrage to our readers as an active and zealous collector; his mounting of specimens is the very perfection of neatness.—ED. C. E.]

COLEOPTERA.—I am desirous of exchanging Coleoptera, especially *Cicindelidæ*, with collectors at a distance.—GEO. DIMMOCK, Springfield, Mass.

COLEOPTERA AND LEPIDOPTERA.—I have a few *Cychrus Andrewsii* and *Ridingsii*, which I should like to exchange for rare Canadian insects: Lepidoptera preferred.—THEODORE L. MEAD, 596 Madison Avenue, New York.

COLEOPTERA.—I should be pleased to exchange Coleoptera with some Canadian Coleopterists, or would purchase species not found in my locality.—ANDREW S. FULLER, Woodside Garden, Ridgewood, Bergen Co., N. J.

ADVERTISEMENTS.

TEXAN INSECTS.—25,000 specimens of Insects from Texas, for sale or exchange. (Reference to Ed CAN. ENT.)—G. W. BELFRAGE, Waco, McLennan Co.. Texas; Care of Forsgard & Co.

CORK AND PINS.—We have received a fresh supply fom England, of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaëger's pins, Nos. 1 to 6, price 50 cents (gold) per packet of 500. Orders will please state whether the package is to be sent by mail or express.

AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P. Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, N. Y.

ENGLAND.—Wm. Wesley, 81 Fleet-street, London, E. C.—Subscription, 5s. per vol.

THE CANADIAN

ENTOMOLOGIST.

VOLUME III.

WITH FORTY ILLUSTRATIONS.

Edited by the Rev. C. J. S. Bethune, M. A.,
Head Master of Trinity College School, Port Hope, Ont.

ASSISTED BY

W. SAUNDERS, London, Ont.; E. B. REED, Barrister-at-Law, London, Ont.; and J. M. DENTON, London, Ont.

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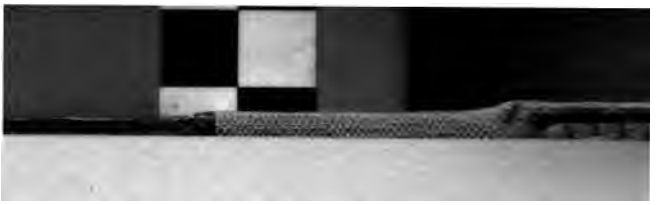

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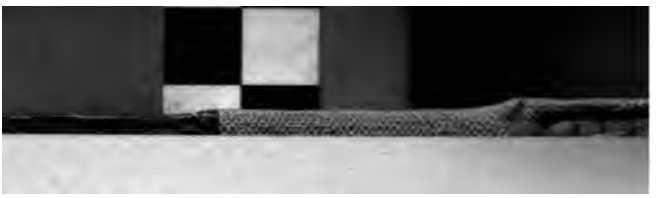

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From nature

G. J. Bowles.

SAMIA COLUMBIA, SMITH. (♀).

CONSTITUTION

OF

The Entomological Society of Ontario,

INCORPORATED 1871.

SECTION I.—(OBJECTS AND MEMBERSHIP.)

1. The Society shall be called "The Entomological Society of Ontario," and is instituted for the investigation of the character and habits of insects, the improvement and advancement of Entomological Science, and more especially its practical bearing on the Agricultural and Horticultural interests of the Province. The Society shall consist of not less than twenty-five members.

2. The Society shall consist of four classes, viz. :—Members Ordinary, Life, Associate and Honorary.

3. Ordinary Members shall be persons whose pursuits, or studies, are connected with Entomology, or who are in any way interested in Natural History.

4. Life Members shall be persons who have made donations to the value of $25 in money, books or specimens (the two latter to be valued by competent persons), or who may be elected as such at the General Meeting of the Society, for important services performed, and after due notice has been given.

5. Associate Members shall be persons residing out of the Dominion of Canada, whose pursuits or interests are similar to those of Ordinary Members. They shall have all the privileges of Ordinary Members except that of voting.

6. Honorary Members shall be members of high standing and eminence for their attainments in Entomology.

7. The number of Honorary Members shall be limited to twenty-five.

8. The Officers of the Society shall consist of a President, a Vice-President, a Secretary-Treasurer, and not fewer than three, and not more than five, Directors, to form a Council ; all of whom, with two Auditors, shall be elected annually at the Annual General Meeting of the Society, and shall be eligible for re-election. The said Council shall, at their first meeting, appoint a Curator.

SECTION II.—(ELECTION OF MEMBERS.)

1. All candidates for admission into the Society as Members, Associate Members, or Life Members, must be proposed by a member at a regular meeting of the Society, and be balloted for ; the affirmative vote of three-fourths of the members present shall be necessary for the election of a candidate.

2. Honorary Members must be recommended by at least three members, who shall certify that the person named is eminent for his Entomological attainments ; the election in their case shall be conducted in the same manner as laid down for other members.

3. Whenever any person is elected a member in any class, the Secretary shall immediately inform him of the same by letter ; and no person shall be considered a member until he has signified his acquiesence in the election.

4. Every person elected a member is required to pay his first contribution within one month of the date of his election ; otherwise his election shall be null and void.

SECTION III.—(CONTRIBUTIONS.)

1. The annual contribution of Ordinary and Associate Members shall be one dollar; all contributions to be due in advance on the first day of January in each year, the payment of which shall entitle the member to a copy of all the publications of the Society during the year. All new members, except those elected at and after the Annual General Meeting and before the following first of January, shall be required to pay the subscription for the year in which they are elected.

2. Every member shall be considered to belong to the Society, and as such be liable to the payment of his annual contribution, until he has either forfeited his claim, or has signified to the Secretary in writing his desire to withdraw, when his name shall be erased from the list of members.

3. Whenever any member shall be one year in arrear in the payment of his annual contribution, the Secretary shall inform him of the fact in writing. Any member continuing two years in arrears shall be considered to have withdrawn from the Society, and his name shall be erased from the list of members.

4. Life and Honorary Members shall not be required to pay any annual contribution.

SECTION IV.—(OFFICERS.)

1. The duties of the President shall be to preside at all meetings of the Society, to preserve good order and decorum, and to regulate debates.

2. The duties of the Vice-President shall be the same as those of the President during his absence.

3. The duties of the Secretary-Treasurer shall be to take and preserve correct minutes of the proceedings of the Society, and to present and read all communications addressed to the Society; to notify members of their election, and those in arrear of the amount of their indebtedness; to keep a correct list of the members of the Society, with the dates of their election, resignation, or death, and their addresses; to maintain the correspondence of the Society, and to acknowledge all donations to it. He shall also take charge of the funds of the Society, and keep an accurate account of all receipts and disbursements, and of the indebtedness of the members, and render an annual report of the same at the Annual General Meeting of the Society, in the manner required by the Act respecting the Board of Agriculture and Arts.

4. It shall be the duty of the Curator to take charge of all books, specimens, cabinets, and other properties of the Society; to receive and arrange in their proper places all donations of specimens; to keep a record of all contributions of books and specimens, with a list of the contributors; and to oversee and direct any exchange of specimens. He shall, also, report annually to the Society on the condition of the specimens and cabinets under his care.

5. The Officers of the Society shall form a Council who shall have the direction and management of the affairs of the Society. The Council shall meet once in every quarter, the time and place of meeting to be appointed by the President, and notice to be given by the Secretary at least ten days beforehand.

6. The Council shall draw up a Yearly Report on the state of the Society, in which shall be given an abstract of all the proceedings, and a duly audited account of the receipts and expenditure of the Society during their term of office; and such Report shall be read at the Annual General Meeting.

SECTION V.—(MEETINGS.)

1. Ordinary Meetings shall be held once a month, on such days and at such hour as the Society by resolution may from time to time agree upon.

2. The Annual General Meeting of the Society shall be held at the place and during the same time as the Exhibition of the Agricultural and Arts Association is being held in each year, to receive and deliberate upon the Report of the Council on the state of the Society, to elect Officers and Directors for the ensuing year, and to transact any other business of which notice has been given.

3. Special Meetings of the Society may be called by the President upon the written request of five members of the Society, provided that one week's notice of the meeting be given, and that its object be specified.

SECTION VI.—(BRANCHES OF THE SOCIETY.)

1. Branches of the Society may be formed in any place within the Dominion of Canada on a written application to the Society from at least six persons resident in the locality.

2. Each Branch shall be required to pay to the Parent Society fifty cents per annum for each paying member on its list.

3. Every Branch shall be governed by the constitution of the Society, but shall have power to elect its own officers, and enact by-laws for itself, provided they be not contrary to the tenor and spirit of the Constitution of the whole Society.

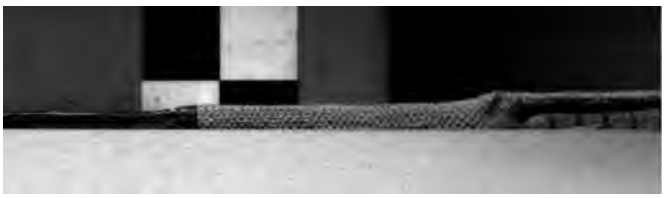
4. All the members of the Branches shall be members of the Society and entitled to all the privileges of Ordinary Members.

5. No Associate or Honorary Member shall be appointed by the Branches, but such members may be proposed at General Meetings of the Society by any Branch, as well as by individual members.

6. Each Branch shall transmit to the Parent Society, on or before the first of September in each year, an Annual Report of its proceedings, such Report to be read at the Annual General Meeting.

SECTION VII.—(ALTERATION OF CONSTITUTION.)

1. No article in any section of this Constitution shall be altered or added to, unless notice be first given at an ordinary meeting of the Society, or of a Branch, and the alteration or addition be sanctioned by two-thirds of the members present at the next ensuing meeting; the Secretary of the Society, or of the Branch, shall then notify the Secretaries of all the other Branches; when the sanction of all the Branches has been obtained in the same manner, the alteration or addition shall become law.



Act of Incorporation of the Entomological Society of Ontario.

Extracted from the Agricultural and Arts Act, 34 Vic. 1870-71.

That the following new section and sub-section read as and be section thirty-three of 31 Vict., c. 29 :—

"The Society now existing and known as the 'Entomological Society of Canada,' may organize and form themselves into a Society, comprising not less than twenty-five members, and paying an annual subscription of not less than one dollar each, to be known as "The Entomological Society of Ontario," and shall have power to adopt a constitution, and make by-laws for the admission of members, and for its guidance and proper management, and the promotion of any objects consistent with the study of Entomology, and its practical bearing upon the Agricultural and Horticultural interests of the Province of Ontario and not inconsistent with the laws of the Province ; and on filing a copy of such constitution and by-laws with the Commissioner of Agriculture, such society shall become a body corporate under this Act."

(1.) And such society shall be entitled to receive, from unappropriated moneys in the hands of the Treasurer of the Province, a sum not to exceed five hundred dollars in any one year :

(2.) The said Society shall hold an annual meeting at the place, and during the same time as the Exhibition of the Agricultural and Arts Association is being held, in each and every year ; and shall at such meeting present a full report of its proceedings and a detailed statement of its receipts and expenditure for the previous year, and shall at such meeting elect a President, Vice-President, Secretary and Treasurer (or a Secretary-Treasurer), and not fewer than three, nor more than five Directors ; and they shall also elect two Auditors :

(3.) A copy of the annual report of its proceedings, and a list of the office-bearers elected, and also a report of such information as the Society may have been able to obtain on the subject of insects beneficial or injurious to the farm and the garden, with such appropriate illustrations as the Society may have been able to obtain, shall be sent to the Commissioner of Agriculture within thirty days after the holding of such annual meeting.

By another section the President of the Entomological Society of Ontario is made a member *ex officio* of the Council of the Agricultural Society.

The Canadian Entomologist.

VOL. III. LONDON, ONT., APRIL, 1871. NO. 1.

OUR THIRD VOLUME.

To all our friends and correspondents—to all who read these pages, we bid a kindly greeting. Once more we are entering upon a new volume; for the third time we solicit the attention and assistance of all lovers of nature throughout the continent—of all especially who delight in the study of the wonderfully varied forms, structure and habits of Insects. In addition, we now also desire to draw into our friendly circle of readers and observers in the same great field of nature, that numerous class of haters of insects, who hate them with a deadly hate, who give them no quarter in any case, and who devote them all alike to execration and unsparing destruction. Friends, we invite you all to come and join us in our work, which is one of deepest pleasure, even though often filled with toil; come with us and search into the mysteries of the insect world; help us to trace out the wondrous beauties of structure, form and coloring of these marvels of the Creator's power; help us to investigate thoroughly the lives, metamorphoses, habits, occupations, food, and all other matters connected with these tiny creatures; join us in working out their scientific arrangement and nomenclature; aid us in rightly discriminating between friend and foe, between noxious, beneficial and neutral insects, and let us all unite in the endeavour to discover the best means of counteracting the ravages of the one, and of encouraging and protecting the other.

In this work all can do something; not only the laborious student of Entomology and the ardent collector of insects, but multitudes of others as well. Every fruit grower, farmer and gardener, every one who cultivates even a square yard of ground, has constant opportunities of learning new facts respecting these ubiquitous creatures, and can, if he but will, add much to our knowledge of them. Careful observation is the first and most important operation, and next the accurate record of the facts observed. It is astonishing how much can be learnt in a single season by any one who will but open his eyes to what is going on about him, and how much true pleasure can be derived from the contemplation. We beg, then, kindly reader, that if you are not already like ourselves a devotee at this particular shrine of Nature, that you will make use of this joyous spring time that has opened upon us, and become initiated into the mysteries of this alluring science. It is a branch of knowledge the pages whereof are open to all, the secrets of which are ready to be disclosed to every enquirer. It requires no costly apparatus, no long journeys in search of materials; its

objects are all about us; go where we will we cannot fail to find them. It is, moreover, fraught with pleasure to the seeker after it, and bears as its fruit results of enormous value to the prosperity and wealth of our country.

To enable us to enlarge our circle of readers and correspondents, and to attract as many as possible into the consideration of this branch of natural history, we are publishing a thousand copies of this number of the CANADIAN ENTOMOLOGIST, and are sending them to all whose addresses we can ascertain, and who are known to be interested in the subjects treated of in these pages, either directly as Entomologists, or indirectly as Fruit-growers and Agriculturists. We beg that all those to whom a copy of this number is sent, and who desire to receive it regularly, will kindly send the amount of the subscription to the Secretary-Treasurer as stated below. Former subscribers will no doubt observe and appreciate the improvements in the appearance, size and embellishment of our Journal. Though our progress has been satisfactory since we timidly put forth a first number in August, 1868, we still hope to continue to prosper and increase, and we trust that all our friends will not deem it too much trouble to give us a helping hand, and introduce us to their neighbors and correspondents.

THE ENTOMOLOGIST will in future be mailed to all members of the ENTOMOLOGICAL SOCIETY OF ONTARIO, FREE.

TERMS OF MEMBERSHIP.

ORDINARY MEMBERS, being subscribers residing within the Dominion of Canada..... $1 00

ASSOCIATE MEMBERS residing in the United States (U.S. c'y.)..... 1 25

" " " Great Britain..... 5s. stg.

All fees are payable in advance in January of each year.

Extra copies 10c. each; $1 per doz.

All business communications and remittances should be addressed to E. BAYNES REED, (Sec.-Treas. Ent. Society of Ontario), LONDON, ONT.

FOR THE BENEFIT of new members and others who may not fully understand the position and constitution of the ENTOMOLOGICAL SOCIETY OF ONTARIO, we have printed in the present number that portion of the Amended Agricultural Act which relates to our Society; also our constitution in full. This covers four pages, and thus lessens the amount of Entomological matter which in future numbers will occupy the full twenty pages.

FIG. 1.
Color: apple green; mauve stripes; orange stigmata.

FIG. 2.
Color: dark reddish-brown.

FIG. 3.
Color: black and brown, with fawn-colored white.

THE PLUM SPHINX MOTH.

Sphinx drupiferarum (Smith & Abbott).

BY E. B. REED, LONDON, ONT.

As this moth pretty generally makes its appearance in our plum orchards from year to year, I have thought it advisable to give a short history of its different stages for the benefit of our fruit-growers.

It is a member of a family of moths to which the great naturalist Linnæus gave the name of *Sphingidæ*, on account of the resemblance he conceived some of their caterpillars bore, in certain positions, to the notorious Egyptian Sphinx, and which our artist has faithfully represented in the engraving of the larva—fig. 1. While the ravages caused by this caterpillar are fortunately not very extensive, yet it generally appears in different localities from time to time in numbers quite sufficient to cause considerable annoyance to the plum growers of those regions. Its conspicuous size, when full grown, and its bright green colored body, and mauve stripes, make it tolerably easy of detection; while the leafless twigs, the result of the voracious appetite necessary to sustain its huge carcass, are sure to cause the eyes of the observant fruit-grower to make diligent search after this monster leaf-eater.

The larva (fig. 1) is hatched from an egg deposited (probably) singly on the under side of the leaf.

Mr. Wm. Saunders has kindly allowed me to make use of his notes on the appearance of the young larvæ.

On the 2nd of July, a pair of *drupiferarum* were brought to him which had been taken *in coitu*. They were confined together in a seidlitz box. The next day the female began depositing eggs, continuing to do so for two or three days.

"Egg: Length .07 inch; slightly oval; surface smooth; color pale yellowish green. In from 6 to 8 days, the young larvæ made their appearance, having eaten their way out through the side of the egg. In some cases one half or more of the egg-shell was eaten; in others only a hole just large enough to allow of the escape of the larva, while in a few cases it was almost entirely consumed.

July 10.—Some out this morning, length .22 inch; head very large, rounded, pale yellowish-green, with a few very short whitish hairs; mandibles tipped with dark brown; body above pale yellowish-green, with a few whitish slightly elevated tubercles on every segment, from each of which arises a single short fine hair, those along each side of the dorsal line dark brown, the others yellowish white. The tubercles are arranged in a double transverse row on the middle and hind segments; caudal horn .10 inch long, nearly erect, black, thickly covered with very short stiffish black hairs slightly furcate at the apex. Each tip terminated by a pale brownish hair longer than the others; under surface similar to upper."

The larva, when full grown, measures about three or three and a half inches. Its color is a beautiful apple green. The head is also green, with lateral dark

brown or black stripes. On each side of the body are seven broad oblique bands of a white color, bordered in front with light purple or mauve. The stigmata or breathing pores are very distinct, and are of a bright orange-yellow color. The caudal horn is long, of a dark brown color, with a yellow tint at the base of the sides. The body is cylindrical in form, and is smooth to the touch. The caterpillar, after satisfying its appetite, or on any sudden alarm, assumes the peculiar rigid appearance shown in the cut, and will remain thus, with its head raised, for a considerable period. The formidable-looking horn on the last segment gives the insect a rather alarming appearance; but it is perfectly harmless, and in fact even at this date naturalists can find no use either for offensive or defensive purposes, for this horn, which is peculiar to nearly all the caterpillars of the *Sphingidæ*. The larva of the Plum Sphinx is generally found in Ontario about the month of July or the early part of August. When it has attained its maturity it ceases eating, and seeks shelter in the earth, where it excavates for itself a convenient chamber which it lines with a water-proof, gummy cement, and there undergoes its transformation into the pupa or chrysalis state.

The pupa (fig. 2) is about $1\frac{1}{2}$ inches in length; its color is dark reddish-brown, and it has a short thick projecting, or as naturalists term it, exserted tongue case. The insect remains in the ground all through the winter and spring, and emerges in its perfect winged state about the early part of June.

The moth (fig. 3) is a large one, its wings expanding from $3\frac{1}{2}$ to $4\frac{1}{4}$ inches. The body is about $1\frac{1}{2}$ inches long, varying slightly in the sexes as to length, that of the female being shorter, somewhat thicker, and more obtuse at the anal segment, while that of the male is longer and tapers almost to a point. Describing this moth from five specimens (2 male and 3 female) now before me, there appears very little difference in the markings of male and female. The antennæ are slightly different, but it requires some slight experience in Entomology to ascertain it. The head and thorax, which are large and thick, are blackish-brown with a whitish fawn color at the side. The eyes are very prominent. The snout-like projection is composed of the *palpi*, or feelers, which are two close-fitting shields for the protection of the proboscis, which lies snugly coiled up between them like the mainspring of a watch. This proboscis or tongue which is shewn in the engraving (fig. 3) is as long as the body of the moth, and is used by the insect in extracting from flowers the honey, which forms its chief food. To a watchful observer, a sphinx moth presents a most curious appearance, not unlike that of a humming bird, while it hovers over some flower bed with its wings humming from their rapid and ceaseless beating, its body poised in the air, and its long tongue projecting like the beak of a bird, and dipping from time to time into the innermost recesses of the various flowers in search of food.

The body of the moth is brown, with a black central line and a black band on either side containing four or five dingy white spots. On the back of the thorax are several fawn-colored blotches or markings which are peculiar to many

of the *Sphingidæ*, and which some of our readers may possibly have noticed in the striking resemblance to a human skull on the thorax of the English death's head moth, *Acherontia atropos*. The wings are long and very narrow, but possessing great strength and evidently adapted for great swiftness. Their general color is dark purplish-brown, with a stripe of white on the front edge extending from the white sides of the head, and with a fawn-colored stripe on the outer edge of the front wing. The hind wings have two whitish wavy stripes with a similar fawn-colored stripe on their outer edge. There are also three or four black oblique streaks on the fore-wings, and generally a black dot on the white stripe.

The engravings of this insect are the work of Mr. C. J. Beale, of Toronto, Ont. That of the pupa and larva are adapted, with some alterations, from the excellent designs of Professor Townend Glover, of Washington. But the beautiful figure of the moth was engraved by Mr. Beale from a specimen in my own collection, and is an admirable *fac simile* of the original insect.

QUEBEC CURRANT WORMS.

BY G. J. BOWLES.

In May last I became the tenant of a house in a central part of the city of Quebec. To this house is attached a garden, which contains a few plum trees, and a considerable number of currant and gooseberry bushes. The plants, however, are very old, and as the garden has been neglected, noxious insects have increased and multiplied to no small degree. I intend in this paper to give my experiences as regards the currant and gooseberry bushes, leaving the rest till another time, and trust that I shall be able to add something to the history of the insects, unfortunately too common, which infest these small fruits.

No sooner had the currants and gooseberries expanded their leaves, than I observed, here and there upon them, a few green caterpillars about half an inch or more in length, which seemed to be in a healthy and flourishing condition. I did not molest them, feeling rather pleased at the idea of having something of the kind to study so near home; and as I intended looking after them when they had grown larger, I did not examine them very closely. In a few days, however, these green caterpillars had disappeared, but the bushes swarmed with another larva, which, to my surprise, I soon found to be those of the notorious currant saw-fly (*Nematus ventricosus.*) Whether or not the green ones I first noticed were larvæ of this species in their last stage, I cannot now say; but if they *were*, it certainly is a corroboration of Mr. Saunders' conjecture, that some individuals hybernate in that state. The currant unfolds its leaves very quickly, and these green caterpillars (which were not geometers), made their appearance almost as soon as the bushes were covered with foliage. Their disappearance so soon afterwards is also a fact which would favor the idea of their being the larvæ of this sawfly.

By the middle of June, the spring brood of *ventricosus* swarmed on the red currants and gooseberries, almost stripping the leaves from some of the bushes. Larvæ of all ages and sizes, from one tenth of an inch to an inch in length, might be found upon a single leaf; some in their old coats of green and black, and some of the largest in their new ones of green only. At the same time the pretty speckled caterpillars of *Ellopia (Abraxis) ribearia*, Fitch, appeared in almost equal numbers. They were more common, however, on the black and red currants than on the gooseberries. The fact of this larva thus feeding on the black currant, disproves the assertion of that eminent entomologist, the late Mr. Walsh, who states [see *Am. Entomologist*, vol. 2, page 13] that none of the currant worms attack that plant.

As the fruit was not ripe, I did not wish to apply hellebore, but set all hands to work picking off the depredators, and dropping them into a basin of water. In this way at least a pint of larvæ of both species were gathered daily for a week, and a very apparent diminution made in their numbers. About the 20th June, I began to find cocoons of *ventricosus*, some fastened singly to the surface of a leaf, some in groups of two or three in the forks of the branches. Of these I gathered sixteen, and having put them in a bottle, in about ten days twelve flies emerged, the remaining four dying in their cocoons, as I subsequently ascertained. These twelve specimens were all males, and I also noticed the males about the bushes several days before the females appeared, although I searched carefully for the latter. At length, about the middle of July, I detected the females on the under side of the leaves laying their eggs in the usual manner, and killed many while engaged in this operation. As soon as the fruit had been picked, I dusted the bushes with hellebore, and found it to be, as reported, a *specific*, completely destroying the *ventricosus* larvæ which came in contact with it, though it did not seem to be so effective in the case of the *Ellopia*. By the end of July, the saw flies [see accompanying figure of sawfly, magnified] and their larvæ had been very much reduced in number, and the geometers which had escaped destruction had passed into the pupa state. On searching at the roots of the bushes, I found many of these pupæ naked in the earth, and a few days afterwards the moths began to appear in great numbers. The net now came into use, and catching half a dozen at a sweep was an ordinary affair, when clouds of them would rise on disturbing a bush. After killing some hundreds in this way, they gradually disappeared, and my two friends were invisible for the rest of the season, with the exception of a few larvæ of *ventricosus*, which I

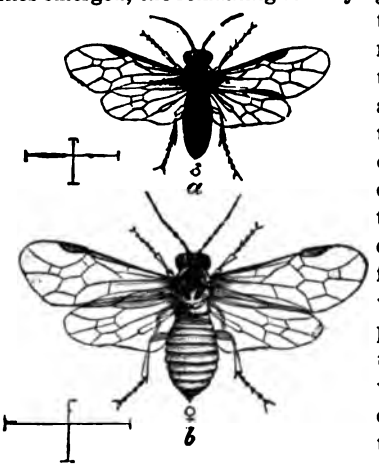


Fig. 4.

now and then discovered, some even in October. I had occasion during that month to remove two of the gooseberry bushes which had been infested, and although I carefully examined the earth from their roots, I could not find any sawfly cocoons. About the same time I examined a dying plum tree which grew near, the bark of which was loose and full of holes, in which, as well as in the forks of the branches within three feet from the ground I discovered many of them. From this it might be inferred that these larvæ do not *invariably* seek the earth before pupating in autumn, but sometimes follow the example of their predecessors, and construct their cocoons in a sheltered place above ground.

I have made enquiries as to the extent of the depredations of these two insects in this vicinity, and find that in some gardens the *ventricosus* has not yet appeared. Where it has gained a footing, however, it is a worse enemy than the *Ellopia*, though the latter is often very numerous and destructive. It seems to be admitted that an imported insect, in America at least, soon becomes a greater pest than the native which attacks the same plant.

Fig. 5.

Nor were these the only foes I had to contend with. In July, *Ægeria tipuliformis* [see fig. 5] came out by dozens, in its pretty dress of steel blue and gold, but met with no mercy despite its beauty. The red currant bushes, which had stood in the garden for a long time, were examined in autumn, and nearly every twig found perforated by this little enemy. I also found a dead pupa of this moth in a stem of white raspberry growing near, within a burrow about three inches in length, which the larva had excavated in the pith.

While searching for the cocoons of *ventricosus* in the currant bushes, I found several pretty chrysalids, which I secured. The moth these produced was *Angerona Crocaotaria*, Guenée, and as I shortly afterwards captured some caterpillars of the same species on the red currant, I am able to give a partial history of the insect. I am, however, indebted to Mr. Saunders, of London, Ontario, for descriptions of the egg and newly-hatched larva, he having kindly placed his notes at my disposal. They are as follows:—

"On the 27th of June, a female laid in a box in which she was confined, about 220 eggs. They were laid in patches or clusters on different parts of the box, containing each from 10 to 40 or 50 eggs. When first deposited, they were yellow, but in a day or two afterwards they changed to a bright red, and on the 4th July some which were about to hatch had turned greyish-brown, soon after which the young larvæ made their appearance. Some still remained red at this date (4th), but all changed to greyish brown before the appearance of the larvæ. They were all hatched by the 7th of July.

"Egg: oval, with a depression above; length, ·03 of an inch; greatest width ·02 inch. The depression above in each egg led me to think that they were barren and drying up, but in this I was agreeably disappointed. Surface nearly smooth under an ordinary magnifier, but under a power of 45 diameters there appear a number of very shallow, small depressions over its whole surface.

"Newly hatched larva: length, ·10 inch; head rather large, bilobed, pale brown with a few fine short hairs and several black dots on each side. Body above, dull yellowish-green, with a dark brown stripe on each side, about half way towards spiracles. Below this the sides of the body are paler, with a whitish bloom over the surface. There are a few short brownish hairs, most numerous on terminal segment. Under surface pale whitish, with a dusky patch of red about the base of the two pairs of prolegs. Feet and prolegs pale, semi-transparent."

Mature Larva (Quebec.) Fed on red currant. Length, 1.50 to 1.75 inch; body gradually increasing in size from head to prolegs; general colour, yellowish green.

Head square and flattened above, with three longitudinal purplish brown and whitish stripes, which are continued on first segment. There are also two small projections like rudimentary antennæ, one on each side of head, ·03 long.

Body yellowish-green, an indistinct whitish dorsal line, a rather broad whitish line on each side, just below spiracles, bordered above with faint purple, which increases in depth of colour towards the posterior rings, and becomes a purple stripe on anal prolegs, forming a resemblance to an inverted Λ. Beneath, same colour as above, but with faint interrupted longitudinal lines. Spiracles white, bordered with purple. Above, on each segment, from 2nd to 7th inclusive, are five minute black dots (four in a square and one in front towards the head), and all the rings have a yellowish band on the swelled part where the succeeding segment is inserted. Legs pale green.

The pupa is ·50 to ·60 inch. in length, and of a dark olive green colour, with the exception of the abdomen, which is pale greenish yellow, and has a row of black dots on each side, and another dorsal row. The wing cases are very prominent, and from their strong contrast with the abdomen in colour make the chrysalis a pretty object. I found them fastened by the tail, and reposing in a slight net-work of silken threads, with which the caterpillar had drawn the edges of a currant leaf half way together, so as to form a kind of cradle. The structure could not be called a cocoon, in fact the chrysalis, which is very lively, had wriggled itself out of its bed in some cases, and hung outside fastened only by the tail. The moth appeared in July, from 10 to 14 days after pupating. It will be seen that it emerges somewhat earlier in the season at Quebec than at London, judging from the dates given by Mr. Saunders.

On the 28th June, I took a *Grapta* larva, almost full grown, from a red currant bush, and after feeding it a few days it became a pupa, and duly produced the butterfly, which, after some hesitation, I have referred to *Grapta progne*. Mr. Saunders says that "it approaches very near to *faunus*, but resembles *progne* still more, though the markings are deeper and richer than usual." The following is a description of the larva:—

Mature Larva: Fed on red currant; length 1·30th inch; cylindrical; general color, yellow.

Head: Medium, flattened, reddish, a blackish triangular spot in front, and a wedge-shaped one on each side, some short whitish hairs, and two black branching horns, mandibles black.

Body: Striped transversely with narrow black and yellow lines; small thorns on second segment; six branching spines each on third and fourth segments; seven each on remaining ones, viz.: three on back, yellow; one each side, orange; and one each side, below spiracles, yellow, out of an orange tubercle; spiracles black, encircled with yellow. Four small black dashes on upper part of each segment, viz.: two on each side above second row of spines, and extending backwards diagonally towards each other. Feet reddish, with a black mark on outer side. When at rest, the caterpillar often coils round the stalk of a leaf, with the hinder part of its body raised in the air.

The general colour of the chrysalis is dark umber brown, slightly mottled with a lighter shade. It has a silvery spot on under side between thorax and abdomen, and is suspended by the tail. The caterpillar became a chrysalis on the 3rd of July, and the perfect insect emerged on the 13th.

On the 3rd of August my attention was drawn to a small black-currant bush by its peculiar appearance. On a closer examination, I found a number of geometric caterpillars, which were resting themselves in their customary manner, by clinging to the branches with their anal legs, and holding their bodies extended. At a little distance they closely resembled the bare stalks of leaves, and it was this resemblance which led me to seek the cause of the bush being affected in such a manner. I gathered twenty-four of these caterpillars, which were all nearly full grown, and fed them on black-currant leaves in a box of earth; but by the 7th of August they had all descended and changed to pupæ on or just beneath the surface of the ground, without forming any cocoon.

The following is a description of this larva:—

Mature larva: Fed on black currant; length 1.75 to 2.00 inches; nearly cylindrical, gradually enlarging to posterior extremity; general color, pea green.

Head: Greyish green, strongly bilobed.

Body: Pale green, with a darker green interrupted dorsal line, and indistinct broken transverse lines of same color; a yellow cross line on posterior end of each segment, and two small tubercles on second segment close to head. The body is also dotted with very small whitish tubercles, and a few short black hairs .04 inch long; spiracles reddish; feet pale green. Some of the largest of these larvæ had a small brown tubercle on each side in front of each spiracle on segment before first pair of prolegs, and a purplish brown ridge on last segment from one spiracle to the other.

The pupa is .60 to .70 inch long, very stout, and of a dark brown color, with a strong point or thorn at the end of the abdomen. With this exception, it has nothing to distinguish it from that of many of the Bombycidæ. The abdomen is slightly flexible.

These pupæ had remained so long in the earth (since August last), without producing the moth, that I became impatient, and brought a few in a small box

into a warm room, hoping to hasten their development. On the 2nd of April, I was rewarded by finding in the box a very fine female specimen of that handsome grey geometer, *Amphidasys cognataria*, Guence, which had escaped from one of the chrysalids, and was the first of the species I had seen alive since 1864.

I had thus no less than *six* different species preying upon my currants and gooseberries, viz.: *Nematus ventricosus, Ellopia ribearia, Ægeria tipuliformis, Angerona crocaotaria, Grapta progne, and Amphidasys cognataria.* Of these, the saw-fly, *Nematus ventricosus*, was decidedly the most destructive. There is still another insect, a dipterous fly, which I have not yet seen in my garden, but observed in others some years ago, and which lives in the fruit of the red and white currant. The history of this fly I hope to investigate during next summer.

HINTS TO FRUIT GROWERS.

Paper No. 1.

BY. W. SAUNDERS, LONDON, ONT.

To make the ENTOMOLOGIST more interesting and useful to fruit growers, it is intended to devote a page of every number issued during the summer season to giving practical hints in reference to insects whose times of appearance may be near at hand, with a condensed summary of such means and remedies as have been found most serviceable in lessening the numbers of such as are injurious. We shall be glad to receive communications from fruit growers, relating to any new insect pests occurring in their neighborhood.

The Plum Curculio (*Conotrachelus nenuphar*). Now is the time to try Ransom's method of trapping the curculio. It may be practiced any time during May and continued with success till early in June. Have the ground made quite smooth and clean for several feet around the base of the tree, and place a few pieces of chip, bark or shingle close around and against the trunk. These will afford convenient hiding places for the insect. They should be turned over and examined once or twice a day, when the curculios will be found attached to the under side, and they can be picked off and destroyed.

It is not expected that this will supersede jarring entirely, but will no doubt, if persevered in, prove a valuable means towards lessening the numbers of this terrible foe to plum culture.

The Tent Caterpillar (*Clisiocampa americana*). The ring-like nests of eggs of this species, so common on the twigs and small branches of fruit trees, are now hatched, and the young caterpillars forming webs in which to shelter themselves. If allowed to proceed and grow without interference, they will soon strip the branches of the trees on which they are located entirely bare, and thus produce an unsightly deformity as well as check the vigor of the tree. Where the affected branches are low, the webs may be removed by the hand and the

insects crushed, and where they are high, the nests may be brought down by means of a pole with a bunch of rags tied to the extremity.

The black Cherry Aphis (*Aphis cerasi*). This disgusting looking little creature begins to appear almost as soon as the foliage is expanded, and multiplies so fast that the under side of the young leaves are soon almost entirely covered with them, and the growth stunted by their continual puncturing and sucking of the juices.

Drenching the tree with weak lye, strong soap suds, or tobacco water, are remedies which have been used with success; but probably nothing is better than the means which Nature employs to keep these creatures within bounds—that is, by the multiplication of their natural enemies. If we assist Nature in this way by introducing into their midst a few Lady Birds, we shall find their numbers soon decrease; for the Lady Birds feed on the Aphis incessantly, as well in the larval or caterpillar stage of their existence as in the perfect beetle state; and when they have abundance of food they multiply very fast. Figures are here given of some of our common species:—

Figure 6 is the larva of a Lady Bird. Figure 7 represents the species known as the 13 spotted Lady Bird (*Hippodamia* 13 *maculata*); and Figure 8 the 9 spotted Lady Bird (*Coccinella* 9 *notata*).

Fig. 6.

Fig. 7.

Fig. 8.

The Bud-moth Caterpillar (*Grapholitha oculana*). Be on the look out for this mischievous little creature—a tiny, pale, dull-brown worm, which is fond of locating itself about the base of the blossom buds where, tying the various flowers or newly-formed fruits together with silken threads, it revels on their substance, soon causing them to blacken and wither. To the amateur fruit grower, whose garden and crop is comparatively small, these are often particularly annoying, and destroy hopes fondly cherished. We know of no better plan than that of hunting this creature out and destroying it by hand. Its presence is soon made apparent by the unhealthy and withered look of the affected buds. Figure 9 represents both the caterpillar and moth of this species.

Fig. 9.

LONDON BRANCH OF ENTOMOLOGICAL SOCIETY OF ONTARIO.

The regular monthly meeting of the London branch was held on Tuesday evening, the 3rd ult., at the residence of the Vice-President, Mr. J. H. Griffiths.

A report of the proceedings of the Parent Society at the Toronto meeting was given by Messrs. Reed and Saunders, in all of which the members heartily

concurred. The requisite alterations were then made in the by-laws to bring them into conformity with the new constitution.

Mr. W. Saunders read a letter from Mr. J. T. Whiteaves, Secretary of the Natural History Society, of Montreal, stating that Mrs. Ritchie had accepted the offer of the London branch for the purchase of the cabinet of insects belonging to the late Mr. A. S. Ritchie.

Several of the members brought with them excellent microscopes, which added greatly to the interest of the proceedings. Many entomological objects were thus submitted to high magnifying powers, and the marvellous details of their structure clearly shown.

ENTOMOLOGICAL GLEANINGS.

[PAPER NO. 4.]

BY W. SAUNDERS, LONDON, ONT.

The eggs of the Vaporer Moth, Orgyia leucostigma.

Attentive readers of the Entomological portion of the late Report of the Commissioner of Agriculture for the Province of Ontario, will have noted the fact already well known to Entomologists that the female moth of this species is wingless, and lays her eggs on the outside of the cocoon from which she has escaped. Last fall the moths were unusually common, and their nests of eggs are now so abundantly distributed among our fruit trees, that unless some effort is made to destroy them, the larvæ will probably be exceedingly numerous and destructive during the approaching season.

Fig. 10 represents the full grown caterpillar of this species, which, when about to change to chrysalis, selects a leaf on which to undergo its next transformation, and this in such a position that, while the chrysalis is firmly attached to it on the one side, *it* is firmly secured by silken threads to the under side of a branch on the other, thus securing the leaf from falling to the ground in the autumn. The female, after its escape from the cocoon, rarely moves more than a few inches from it, waiting the attendance of the male moth, after which she at once commences to place her eggs in the position already indicated. But how are the eggs, when laid, kept in their place on the top of the cocoon? Dr. Fitch says that the eggs are extruded in a continuous string, which is folded and matted together so as to form an irregular mass. On removing this mass of eggs from its place of attachment, the surface of the cocoon appears covered with fragments of a transparent gelatinous looking substance, which has evidently been applied in a fluid state.

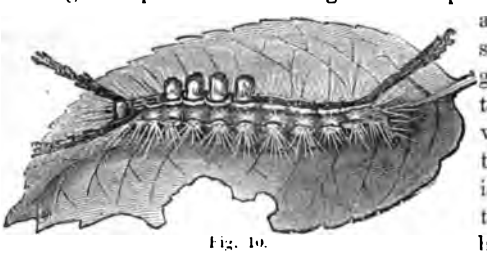


Fig. 10.

The bottom layer of eggs will usually number 100 or more, and their interstices are well filled with this same gelatinous substance, which adheres so strongly to the eggs that when the nest is torn open they cannot be separated without bringing away portions of this material firmly attached. Another irregular layer of eggs is placed on this, then a third, and sometimes a fourth, before the total number is exhausted, and through the whole of these the gelatinous matter is so placed as to secure every egg, not by being imbedded in a solid mass, but surrounded by the material worked into a spongy or frothy state. Possibly this may be to economize the amount used. Over all is a heavy layer of the same with a nearly smooth greyish white surface, the whole number of eggs being placed so as to present a convex surface to the weather, which effectually prevents the lodgement of any water on it.

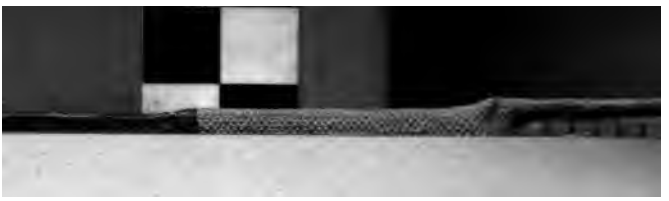
Within this enclosure are deposited from 375 to 500 eggs. We give these numbers because we have counted the contents of several, and 375 is the lowest number and 500 the highest we have found. The egg is nearly globular, flattened at the upper side—not perceptibly hollowed—with a dark point in the centre of the flattened portion surrounded by a dusky halo. Its surface is smooth under a magnifying power of 45 diameters; but when submitted to a higher power, appears lightly punctured with minute dots. Its color is uniformly white to the unaided vision; but the microscope reveals a ring of dusky yellow surrounding it immediately below the flattened portion. Its diameter is 1-25th of an inch.

A careless observer seeing a dead leaf here and there upon his trees might readily conceive that it was accidentally blown into the position it occupied, and perhaps held there by a spider's web or something of that sort; but as will be seen from what we have said, a closer examination will furnish food for thought, in the wise arrangements made by the parent moth in providing for the safety of her future offspring; and at the same time may well excite alarm in the fruit grower's mind when he perceives promise of the approaching birth of such a horde of hungry caterpillars as even one of these will produce.

MISCELLANEOUS NOTES.

COLEOPTERA.—The following notes upon the localities for finding certain species of *Coleoptera*, all taken in April, in Massachusetts, may be of some use to collectors:—

Under much decayed butternut bark were found *Omosita colon*, *Hister Lecontei*, *Ips fasciatus*, *Phenolia grossa*, *Cucujus clavipes*, and *Cossonus platalea*. About fresh-cut maple and birch stumps where the sap was flowing, *Ips fasciatus*, and *sanguinolentus*, and *Staphylinidæ* of various species. Under loose pine bark, *Boros unicolor* and *Rhagium lineatum*. Around fresh cut pine wood where the pitch was oozing out on sunny days, *Tomicus pini*, *Hylurgus terebrans*, *Pissodes strobi*, *Hylobius pales*, *Clerus nigripes*, and *trifasciatus*, were very abundant.



To collect those species of *Scolytidæ* and *Curculionidæ* that live upon pine, it will be found very successful to go out just at dusk after a sunny day, when they have taken refuge under the chips about fresh cut pine wood-piles. They can then be taken in abundance.—GEO. DIMMOCK, SPRINGFIELD, MASS.

OMISSION.—A valuable paper by V. T. Chambers, Esq., of Covington, Kentucky, U.S., on "A New Species of *Ceniostoma*"—one of our Canadian *Micro-lepidoptera*, belonging to the family *Tineina*—was received too late for insertion in the present number, but will appear in our next, which we hope to issue during the month.—ED. CAN. ENT.

REMITTANCES

RECEIVED SINCE JANUARY 1ST, 1871.

J. G. G., Toronto, $1; R. V. R., Kingston, $6; G.D., Springfield, Mass., $2.24; T. L. M., New York, $1.12; O. S. W., Chicago, $3.37; J. P., Grimsby, $2; Dr. M., Grimsby, $2; A.S.F., New York, $1.80; V.T.C., Covington, Ky., $1.12; Dr. E.S.H., Grand Rapids, Mich., $4; Dr. G., Bayfield, $1; J.M. J., Halifax, N.S., $3; W.H.E., Toronto, $1; J. B., San Francisco, Cal., $4.45; C. J. S. B., Port Hope, $1; N.H.C., Stratford, $2; P.S.M., Detroit, Mich., $1.

EXCHANGES, &c.

LEPIDOPTERA. — Canadian Lepidoptera desired in exchange for British.—E. H. COLLINS, *Daily News* office, Kingston, Ont.

PUPÆ AND OVA OF LEPIDOPTERA.—I am desirous to obtain, if possible, *live* Pupæ and Ova of certain Canadian and other North American Lepidoptera. Would purchase, or give in exchange, English or other European species.—CHAS. GEO. ROTHERAM-WEBSDALE, 78 High-street, Barnstaple, England.

COLEOPTERA AND LEPIDOPTERA.—I have a few *Cychrus Andrewsii* and *Ridingsii*, which I should like to exchange for rare Canadian insects: Lepidoptera preferred.—THEODORE L. MEAD, 596 Madison Avenue, New York.

COLEOPTERA.—I should be pleased to exchange coleoptera with some Canadian Coleopterists, or would purchase species not found in my locality.—ANDREW S. FULLER, Woodside Garden, Ridgewood, Bergen Co., N. J.

AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P.Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J.Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

ADVERTISEMENT.

CORKS AND PINS.—We have received a fresh supply from England, of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, No's. 1 to 6, price 50 cents (gold) per packet of 500. Orders will please state whether the package is to be sent by mail or express.

The Canadian Entomologist.

VOL. III. LONDON, ONT., JUNE, 1871. NO. 2.

TO OUR FRIENDS.

We very much regret that the new type with which the present number is printed did not reach us in time to be used for No. 1. There had been so much delay in beginning the volume, that we thought it best to use such material as we had at command rather than postpone its commencement longer. The printing and general appearance of our little monthly is now as near perfection as we can hope to reach, and will in future be uniform. We trust all our readers will show their appreciation of our efforts to improve the Entomologist by sending a few more names to add to our increasing list of membership; and we should also feel obliged if those of our old members whose annual subscriptions are not yet paid would remit to the Treasurer as promptly as possible.

When issuing our last number, we printed an unusually large edition, intending to send a copy to every person in Ontario known to be interested in Entomology directly, or indirectly as agriculturists or horticulturists, with the hope of largely increasing our list of subscribers. When mailing we found our surplus copies not sufficient for the purpose, and intend printing an extra number of the present issue, which we shall send to all those who did not receive No. 1. For the benefit of such we append the contents of our first number, of which we still hold sufficient to supply new subscribers:

Constitution of the Entomological Society of Ontario.
Editorial.
The Plum Sphinx Moth, with 3 illustrations.
Currant Worms, with 2 illustrations.
Hints to Fruit Growers, with 3 illustrations.
Entomological Gleanings, with 1 illustration.
Miscellaneous Notes, &c.

Subscriptions, one dollar ($1.25 in U. S. currency) per annum, should be sent to the Secretary, E. B. Reed, Esq., London, Ont.

ON THE LARVA OF THE PEACH BORER.

(Egeria Exitiosa.)

BY W. SAUNDERS, LONDON, ONT.

The accompanying figure, No. 11, is a faithful representation of the larva of the Peach tree Borer, an insect which in some localities is so injurious and abundant as to sadly interfere with successful peach culture. The grub from which this woodcut was prepared was found in company with several others early in March, in some gummy matter lying on the soil immediately surrounding a peach tree. One, which was somewhat smaller than the rest, was dug out of its bored channel in the tree, where it was still feeding.

No. 11.

The following description will, we hope, enable any one to distinguish this pest beyond doubt when it is met with:

Its head is of a medium size, with a depressed line down the centre dividing it into two lobes. It has a triangular piece inserted in the middle, with its base towards the mouth, and its apex terminating just under the anterior edge of the second segment. The head is also flattened, and of a reddish color, becoming darker, almost black, on its anterior edge. The jaws are black and prominent.

The body above is of a dull pale yellow, with the segments or rings of the body rather deeply cut. The second segment is of a pale reddish brown color, smooth and horny looking. On each segment there are a few minute pale reddish dots, from which arise short reddish or brownish hairs—those along the sides and on the posterior extremity being somewhat longer. A faint line runs along each side through the stigmata or breathing pores of a paler shade than the rest of the body. The stigmata are small, nearly round, and of a dull reddish color.

The under surface is very similar in color to the upper. The feet are tipped with reddish brown, and the prolegs are pale yellow, with the fringe of hooks, crowning each of a dark reddish brown.

The grub becomes a chrysalis early in the spring, from which the wasp-like moth is produced late in June or early in July, which, soon after pairing, lays its eggs on the bark of the trunk of the tree, near its base. Here the young grubs, as soon as hatched, eat their way to the inner bark, and commence their work of destruction.

To prevent the moths from depositing their eggs, some recommend

mounding the trees well up with earth, two or three feet high, early in June others brush the trunk and main branches over with soft soap, reduced with water so as to bring it to about the consistence of paint.

A NEW SPECIES OF CEMIOSTOMA.

(Micro-Lepidoptera, Tinеina.)

BY V. T. CHAMBERS, COVINGTON, KY.

[Some little time ago Mr. Chambers sent us a specimen of the insect referred to in the following communication, and desired our opinion respecting its specific position. Being unable to give any definite opinion on the matter, as we know but little of the Micro-Læpidoptera, we sent his note and specimen to Mr. Stainton, the great English authority on the Tineina. He very kindly examined the specimen, and communicated his views respecting it, through us, as noticed below.—ED. C. E.]

Your letter reached me just as I was starting to an adjoining county where a term of Court has detained me until now. As you request, I send a notice of the *Cemiostoma* for the CANADIAN ENTOMOLOGIST. I am satisfied that it is a new species, and call it *C. Albella.* It is of a glistening snowy white. There is a small tuft on the head,—the antennæ pale fuscus with the apex and basal joint, white. On the costa beyond the middle is a pale golden streak, dark margined on both sides, obliquely placed, pointing towards the anal angle, *but not produced to it:* towards the apex, on the costa, is another larger pale golden spot, with slightly diverging sides, but faintly dark margined posteriorly, though distinctly so anteriorly. The apical spot is shining silvery gray metallic with very distinct black margins anteriorly and posteriorly; behind it, at the base of the ciliæ, is an indistinct pale golden streak, which on the costal margin touches a small fuscus spot in the cilia, but which does not touch the dorsal margin. There is a minute indistinct fuscus spot at the apex of the ciliæ. Abdomen white, banded above with golden fuscus.

This would seem to be intermediate between *C. Susinella*, Higa, and *C. Spartifoliella*, Stainton, approaching more nearly to the former. Possibly it may prove to be what the late Mr. Walsh would have termed a "phytophagic species," or variety of the former. I have never seen either of those species, and I compare this insect only with the descriptions of those species contained in "Stainton's Tineina." The description there given of *Susinella* is very brief, and *Albella* differs from it in not having the

first costal streak produced to the anal angle; in having a pale golden streak in the ciliæ, behind the apical spot, which is not mentioned by Stainton, and in having only two faint fuscus spots in the ciliæ, one of them at the apex very indistinct, instead of two ciliary fuscus streaks pointing upwards, as Stainton says of *Susinella*; and still more in having a distinct tuft on the vertex, whilst, according to Stainton, *C. Scitella* is the only known species which possesses such a tuft, and *Scitella* cannot be mistaken for this. It is also clearly distinct from *C. Spartifoliella* and *C. Laburnella*, although it strongly resembles them.

The larva mines the leaves of the silver-leaved and Lombardy poplars, *(P. Alba and P. Dilatata.) Susinella* mines the leaves of *P. Tremula* and these are the only known poplar-feeding species. It leaves the mine in the latter part of September, and spinning about them small cables of the purest white silk, it spins its cocoon beneath them and becomes a pupa in the fall, the imago emerging in the next April. The cocoon is oval, flat, and snowy white. According to Stainton *Spartifoliella* is the only species which forms its cocoon in such situations.

If, as I believe, this insect is distinct from *Susinella*, it has not yet been observed in Europe. Yet as both of the trees upon which it feeds are imported species, *Albella* is probably a European insect. So far as I am informed this is the first time that any species of Cemiostoma has been observed in this country, and yet *Albella* is very abundant on both *P. Alba* and *P. dilatata*, and it is strange that it has not been observed both in this country and in Europe, if it is found there. The mine is very conspicuous, and sometimes the upper and lower cuticles of the entire leaf are separated, and the leaf deadened, but in such cases several larvæ are found in it.

Up to the date of the publication of Vol. I. of Stainton's Tineina but six species of Cemiostoma had been observed, all of which were found upon the European continent, but only three of which had been observed in England. *Susinella*, which approaches most nearly to *Albella*, has never yet been found in England, but I believe that since the publication of that work two new species have been discovered in England, and one or two in India.

A single specimen of *Albella* was sent to Mr. Stainton, (by your kindness,) who writes that he is inclined to separate it as a distinct species, but that he cannot be positive, as the specimen was slightly injured. Among four specimens examined by me I cannot discover the slightest difference.

P. S.—As no one except myself, so far as I know, is giving much attention to our "Micros," and as I have a good many new, beautiful and interesting species, if you desire it I shall occasionally notice them in the ENTOMOLOGIST.

[We shall be very glad to receive our Correspondent's communications, and trust that he will follow up the work so well begun by the late lamented Mr. Brackenridge Clemens.—ED. C. E.]

HINTS TO FRUIT GROWERS.

Paper No. 2. BY WM. SAUNDERS, LONDON, ONT.

The gooseberry saw fly *Nematus Ventricosus.* The season of warmth and growth having opened this year early, this never-failing pest has put in its appearance also in advance of previous years; as early as the 23rd of April I found the insect on the wing preparing to deposit its eggs as soon as the foliage was sufficiently expanded. Our last number contained an enlarged figure of the fly—See fig. 4.) We now give a representation of the larva in its natural position, feeding on the leaves. (See fig. 12.) The fly deposits itswhite eggs in long regular rows on the under side of the leaves, chiefly on the larger veins, where they speedily hatch, and the hundreds of voracious worms resulting are soon scattered all over the bushes. Already, May 15,the eggs are very numerous, and here and there may be found a colony of larvæ. These latter, while young, feed in company, from 20 to 40 on a leaf, which is soon riddled with the small holes they at first make, but in a few days they increase in size, and parting company spread in all directions. By keeping a close watch, and picking off the eaten leaves early in the season, the evil will be much lessened, but where the worms are numerous there is nothing so good as Powdered Hellebore, which may be readily and economically applied by mixing an ounce (previously rubbed up

Fig. 12.

with a little water to prevent its being lumpy) in a pail of water, and showering it over the bushes with a watering pot. Many people are timid about using hellebore while the fruit is on, for fear of its finding lodgment there in quantities sufficient to produce unpleasant consequences when the fruit is eaten, but if applied in the way just mentioned there need be no apprehensions on this point.

The Plum Curculio. Although we referred to this insect in our last, it will not do to pass it over in silence now, for by the time this reaches the eyes of our readers the young fruit will have formed, and jarring should at once begin and be steadily kept up every evening until the fruit is pretty well grown. The severe frost we have had has considerably injured the plum blossoms in this western section, and we believe that the crop will consequently be light, hence plum growers should be on the alert and dispute possession with the "little Turk" from the very beginning. The most convenient form of sheet to spread under the trees is that made with two pieces of cotton of the requisite size, stitched only half way up the middle, so as to allow the tree to pass to the centre, and having a strip of wood attached to each of the outer edges, so that it may be conveniently handled. Small trees may be jarred with the hand, larger ones should have a branch cut off, leaving a stump which may be struck with a mallet, or else have a hole bored in the tree, and a broad-headed iron spike inserted, which may be struck with a hammer. The accompanying figure 13 shows the Curculio in its different stages of larva, *a*, chrysalis *b*, and perfect insect *c*; the hair lines alongside of each object shows its natural size; *d* represents a Curculio working on a young plum in which one egg has already been deposited.

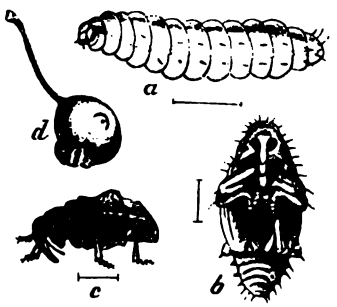


FIG. 13.

The Codling Moth *Carpocapsa pomonella*. This insect, so destructive to the apple, usually appears in Ontario from the middle to the end of June, but the season having opened earlier this year than common, we may look for them in the beginning of the month, and in a fortnight later they will probably be busy depositing their eggs about the eyes of the young apples. Excellent traps may be made for them out of common bottles—widemouth ones preferred—by partly filling them with a mixture of vinegar and water, well sweetened with sugar, and having a little rum or other strong smelling

spirit added to it. These may be fastened among the branches of the trees with cord or pieces of wire. The insects, being attracted by the smell of the compound, they are lured into the bottle and drowned, and thus the mischief they were about to perpetrate is nipped in the bud. Later in the season the wormy fruit should be carefully gathered, and either dipped in boiling water to destroy the grubs, or fed to hogs. Fig. 14 delineates the various stages of the insect: *a* section of apple attacked, *b* point at which the egg was laid and at which the young worm entered, *c* the full grown worm, *h* its head and portion of body magnified, *i* the cocoon which it spins, *d* the chrysalis enclosed in the cocoon, *f* the perfect insect as it appears when at rest, *g* the same with its wings expanded.

Fig. 14.

Borers. June is the month for borers of all kinds, so look out for your apple trees; prevention in this instance is far better than cure, and by taking a little pains now the entrance of the borer may be prevented. Soft soap, reduced with water to the consistence of thick paint, and applied copiously over the trunk, and a short distance up the main branches of the tree, will prevent the beetles from depositing their eggs on such at all, and besides will have the effect of cleansing the bark from many other animal and vegetable parasites.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

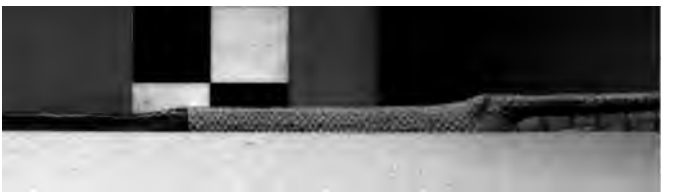
Compiled by the Editor.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Vol. II., Page 176.

FAMILY HALIPLIDÆ.

[This family, usually regarded as a sub-family of the *Dytiscidæ*, is restricted by Leconte to the genera *Haliplus* and *Cnemidotus*; but Kirby, as will be observed, includes it in the genera *Hydroporus* and *Laccophilus*.]



93. HALIPLUS IMPRESSUS, *Latr.*—One specimen taken in Lat. 65°. Length of body 1½ lines, nearly.

[66.] Body, reddish-yellow. Head punctured, dusky behind: prothorax yellow, depressed in the middle posteriorly, with a transverse curved series of punctures in the depression; anteriorly there are five or six black dots arranged transversely; at the base, between the central point and the margin on each side, an oblique little furrow, but not easily discoverable, is impressed: elytra pale-yellow, with a cinereous tint, nine rows of black punctures on each, those near the lateral margin being the faintest; anteriorly, in the interstices of the rows, there are also a few black punctures; the apex of the elytra is oblique, terminating in an acute point: the laminæ that cover the posterior legs are punctured. [Kirby is doubtful respecting the identity of this specimen with Latreille's species, as though the latter's description agrees with it, his figure does not, for it represents the elytra with eight black spots, which are not to be found in *H. Impressus*. Le Conte puts it down as a probable synonym of *H. Immaculicollis*, Harris, a species taken in Canada, and regards its identification with Latreille's species as erroneous.]

94. HYDROPORUS NIGRO-LINEATUS, *Stephens.*—A pair taken in Lat. 65°. Length of body 2½ in.—2¾ lines.

Body lurid-yellow, somewhat glossy, minutely and thickly punctured: antennæ dusky at the tip: prothorax with a minute black rhomboidal spot in the disk, which is marked with a punctiform impression; anteriorly it has a transverse series of punctures larger than those of the rest of its surface: elytra most numerously and minutely punctured: the suture and four longitudinal stripes not reaching the apex, nor the first and third the base, all black; the fourth, or outermost, is distant from the margin and interrupted: the alitrunk and abdomen are black. In the female, which is less glossy, the external stripe is continuous, and only the second reaches the base; and in the male the prothorax is more conspicuously punctured, and the anterior series of punctures is wanting.

[67.] 95. HYDROPORUS PARALLELUS, *Say.*—One specimen only taken. [Previously described as *H. Catascopium Say*, and subsequently as *H. Interruptus Say*: For descriptions *vide* Say's Ent. Books, ii., 98, 516,560. Taken in Canada.]

96. HYDROPORUS LÆVIS, *Kirby.*—Length of body 2 lines. One specimen only taken.

Very like the preceding species, but smaller; it differs principally in being perfectly smooth and without punctures, even when examined under a powerful magnifier. The head has two larger vertical lurid-yellow spots, and there is a triangle of the same colour between the eyes, which at its base is dilated, and occupies the nose and mouth: the prothorax is lurid-yellow with two oblong oblique dusky spots beyond the middle; towards the base is an obtus-angular transverse impression, and on each side, at a little distance from the margin, is an oblong punctiform impression: in the elytra are six distinct narrow black stripes, none of which are confluent except at the apex; at the side, but at some distance from the lateral margin, are three black spots placed in a line, or a stripe wider than the others twice interrupted: the legs are testaceous with the posterior tibiæ black at the tip. [Placed, with a mark of interrogation, as a synonym of *H. Duodecimlineatus, Lec.*, in Le Conte's list, p. 16.]

[68.] 97. HYDROPORUS PICATUS, *Kirby*.—Length of body 2½ lines. A single specimen taken in Lat. 54°.

Body, dark piceous, without gloss; covered, especially above, with an infinity of punctures. Head, obscurely ferruginous, dusky behind, with a paler quadrangular spot extending to the mouth, between the eyes: antennæ ferruginous: prothorax, with its anterior half, ferruginous, marked with a discoidal punctiform impression or little furrow: elytra, with four posteriorly abbreviated punctured furrows, very difficult to be discerned, and only by looking on one side from behind: forebreast and legs ferruginous: alitrunk and abdomen black.

98. HYDROPORUS SIMILIS, *Kirby*.—Length of body 2⅛ lines. Taken with the preceding species?

I at first regarded this as the other sex of *H. Picatus*, but upon inspecting their tarsi I found they were both males. This species is smaller, more glossy, the parts that in that are dark ferruginous, in this are much paler; the punctures on the upper surface are less numerous and larger, especially those of the basilar half of the elytra, and the four furrows, particularly the three dorsal ones, are deeper and more distinct; the disk of the prothorax also is transversely levigated and impunctured. Both these insects come very near to *H. Picipes*, but that species has not the discoidal impression in the prothorax; and its elytra are dark testaceous, striped with black.

N.B.—All the above divisions belong to Mr. Stephen's second division of the family with the sides of the prothorax rounded. [*H. Similis* has been taken in Canada.]

[69.] 99. LACCOPHILUS BIGUTTATUS, *Kirby*.—Length of body 2 lines. One specimen taken.

Body, very smooth, glossy. Head, dirty-yellow; palpi and antennæ dusky at the tip; manitrunk (the manitrunk is that part of the trunk that bears the arms or fore-legs: it includes the prothorax and antepectus), dirty yellow; elytra, embrowned cinereous, with a line of punctures, as in the other species, adjacent to the suture, and a pale yellow, indistinct, oblong, anterior, marginal spot: legs, dirty yellow; posterior tarsi, dusky; alitrunk and abdomen, nigro-piceous; apex of the segments of the latter reddish-yellow. This species is smaller than *L. minutus*, which it resembles, and the colour of the elytra and underside of the body differs. [Inserted as a probable synonym of *L. fasciatus* Aubè, in Le Conte's list; in Melsheimer's Catalogue it is recorded as synonymous with *L. proximus* Say and *L. Americanus* Aubè.]

FAMILY DYTISCIDÆ.

100. COLYMBETES SEMIPUNCTATUS, *Kirby*.—One specimen only taken. Length of body 3¼ lines.

Body oblong, glossy, very black, above very slightly bronzed; under a powerful magnifier the whole upper surface is most minutely reticulated, and the under covered, with longitudinal scratches. Head with a pair of vertical red crescents placed transversely, and scarcely visible except when the sun shines; upper-lip, palpi, and antennæ ferruginous; mandibles black; prothorax, anteriorly with a continuous transverse marginal series of punctures, posteriorly with one widely interrupted in the middle, and in the disk with a minute furrow; elytra with a triple dorsal series of punctures not regularly or singly arranged, with other scattered punctures interjacent, especially towards the apex, on the side the punctures, which are not numerous, are scattered without order; in the sutural series the punctures are distant and single; beyond the middle of each elytrum, not far from the lateral margin, is a red streak, not distinctly visible except in a strong light: the arms are piceous, and the four anterior tarsi ferruginous. [Belongs to *Agabus*. Taken at Grimsby, Ont., by Mr. Pettit.]

[70.] 101. COLYMBETES (AGABUS) BICOLOR, *Kirby*.—Length of body 3½ lines. A single specimen taken in Lat. 54°.

Body nearly elliptical, convex, smooth, glossy, and very black. Reticulations more visible in the head than in the rest of the surface; a pair of round, obscure red spots in the vertex; mouth palpi, and antennæ testaceous: anterior transverse series of the prothorax with single punctures at

the sides, but scattered ones in the middle, posterior series continuous, with single and rather distant punctures; elytra, externally of a pale mahogany colour, with a double series of punctures, not numerous nor regularly arranged, which do not reach the apex; there are a very few scattered punctures besides in the side: legs mahogany-colour.

102. COLYMBETUS (AGABUS) PHÆOPTERUS *Kirby*.—Length of body 3¼—3½ lines. Two specimens taken in Lat. 54°.

Body nearly elliptical, rather depressed, smooth, very black, glossy. Head with a pair of transverse obscure red spots in the vertex; mouth and antennæ testaceous; posterior series of the prothorax thickly punctured, and discontinuous in the middle: elytra brown, a little paler at the base and side: epipleura yellow: sculpture of the elytra like that of *C. Semipunctatus*, but fewer punctures in the side: legs ferruginous: body underneath longitudinally scratched. This species appears to be the American representative of *C. paludosus* (*Dytiscus politus* Marsh) which it nearly resembles, but the anterior part of the front is black, and not yellow as in that species; and the prothorax is wholly black, without a broad rufous margin. [Placed with a mark of interrogation as a synonym of *Agabus obliteratus* Lec., in Le Conte's List, p. 17.]

[71.] 103. COLYMBETES (AGABUS) BIFARIUS, *Kirby*.—Plate v., fig. 6. Length of body 3¼ lines. A single specimen taken in Lat. 54°.

Body oval, smooth, black, less glossy. Head with a pair of vertical red crescents: mouth, antennæ and palpi ferruginous: maxillary palpi with the last joint black: prothorax longitudinally aciducted, with the bead of the lateral margin rufous: elytra, at the base longitudinally, at the apex transversely, aciducted: fore-breast and legs piceo-rufous.

104. COLYMBETES RETICULATUS. *Kirby*.—Length of body 3¼ lines. Three specimens taken in Lat. 65°.

Body oblong, black, gloss obscured from its being covered as it were with a web of the finest net work, sculptured as if with the point of a needle. Head with a pair of round red vertical spots: prothorax with a yellow mesal band and lateral margin: elytra dusky-cinereous, with the side yellowish: legs ferruginous. [Not mentioned in either Le Conte's or Melsheimer's Catalogues.]

105. COLYMBETES PICIPES, *Kirby*.—Length of body 4¼ lines. Two specimens taken, one in Lat. 54°, the other in Lat. 65°.

[72.] Body oval, black, above slightly bronzed, not glossy, covered above and below like the preceding species with, as it were, a web of net-

work; but the reticulations are more minute. Upper-lip, palpi and antennæ ferruginous; a pair of oval, minute, obscure red spots mark the vertex: prothorax, with the anterior transverse series of punctures double in the middle, the posterior one not easily discernible, discontinuous in the middle: there appear no rows of punctures on the elytra, but a few scattered ones may be discovered: the four anterior legs are piceous. This species approaches *C. chalconatus*, but it is longer, less glossy, the reticulations of the surface are more distinct, no rows of punctures are discernible, as in that, on the elytra, which, as well as the prothorax, are all of one colour: and the posterior legs are black. It seems still nearer *C. ater*, but it is much smaller, less convex, and has no fenestrated spot on the elytra. [Taken in Canada.]

106. COLYMBETES ASSIMILIS, *Kirby*.—Length of body 5¾ lines. Taken in Nova Scotia by Dr. MacCulloch.

Body rather depressed, between oblong and obovate, smooth, rather glossy, black, covered above with an infinity of very minute reticulations. Head dirty-yellow; vertex black, with a pair of confluent transverse reddish spots: prothorax dirty-yellow, rather dusky in the disk, transverse punctures nearly obliterated: elytra of the same colour as the prothorax, but sprinkled with innumerable black dots, which, however, do not extend to the base and sides; a row of more distant and larger dots adjoins the suture: the fore-breast, the base and apex of the other ventral segments of the abdomen, are dirty yellow; the legs are of the same colour, but the arms are shorter than usual and piceous; the dilated posterior coxæ are sculptured with branching rugosities. This species represents *C. notatus*, which it is very like, but the elytra are wider towards the apex which gives the insect an obovate shape; the black dots of the elytra are more numerous and minute; the prothorax is without spots; and the arms, or fore-legs, are shorter and of a different colour. [Included under *Agabus* in Melsheimer's Catalogue.]

ENTOMOLOGY. No. 1.

BY WILLIAM COUPER, MONTREAL.

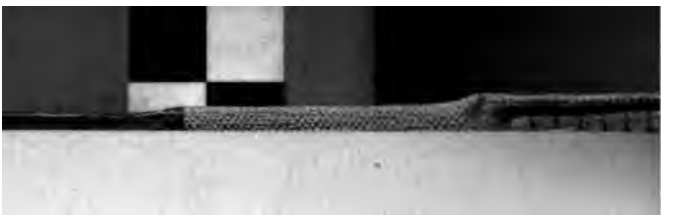
The approach of the season for the study of the habits of insects urges me to write a few hints for the guidance of young Canadian beginners. I find that many young persons collect insects more for the sake of recreation and pastime than for the value of the material to aid future investiga-

tion. Occasionally one may meet a tyro who can discriminate insect forms, and possess that peculiar acuteness so essential to the study of Entomology; but still he has sad defects, that is, clumsiness in the preparation of his specimens, and want of method. Now, this should be avoided, and the first determination of a young collector who wishes to be successful must be neatness in mounting his specimens, with a zealous regard for the preservation of his cabinet. In order to carry out this determination satisfactorily, the first great requisite is *patience*, the second is *quickness*; but independently of this quality, I contend that patience is the chief gift to make a successful Entomologist. Without it, he cannot grasp an abstruse subject, for being too hasty, his brain wanders to isolated points, magnifying them, to the exclusion of other more important ones, whereas he should watch patiently, and record facts as they gradually come before him.*

It is little use attempting a collection of insects unless the proper appliances are at hand to procure and secure the specimens. A proper collecting box should always accompany the net, and delicacy of handling insects (especially Lepidoptera) practiced in the field. Neatness in arrangement is a home work, but the great secret of having fine specimens is in the care taken in first handling. To help the memory, a note book should be carried in the pocket, wherein to record descriptions of the insects taken in his rambles. He will find these notes of great value afterwards, especially when he becomes an advanced student. I have found a field note book indispensible, and would recommend every young collector to take notes of his captures.

I would also suggest to our intelligent agricultural friends that such note books are highly valuable, should they take the trouble to notice and record such facts as are every season occurring on their farms. Correctly noted books of this description, coming from the hands of intelligent farmers, would be of immense service to Entomology, and would no doubt lead to discoveries which are at present hid in obscurity. Mr. Stainton says: "An agriculturist, knowing nothing of Entomology, thinks that if he is annoyed by some new 'varmin' he has only to apply to some professor of Entomology to be at once told the best way to get rid of his foe; but this is not the best mode to go to work. Those enterprising agriculturists

* "In order to keep the mind free from prejudice or one-sided views, it is necessary to examine and judge for one's self; we are very apt to conclude that because another says a thing is so, it *must* be so; it *may* be so, we grant, but look and judge for yourself; perhaps you will find it very different from what you expected." —STAINTON.



who know how much the safety of their crops depends upon the absence of the ravages of the insect hosts, and who know that 'knowledge is power,' will set *themselves* to work to obtain a practical knowledge of Entomology, in order that, when they find their wheat or any other crop affected, they may themselves be able to discover the cause of the injury, and apply the proper remedy. The Entomological agriculturist who himself lives on the spot, and sees the smitten crops day after day, will be far better able to cure the disease (if the disease be a curable one) than the cleverest agriculturist knowing nothing of Entomology would be capable of doing, even after consulting the cleverest Entomologist who knows nothing of agriculture. It is a most necessary part of the education of the agriculturist, that he should be well acquainted with Entomology, and know his friends from his foes. Some assume that all insects are hostile, and are to be indiscriminately destroyed—about as sane a proceeding as though an *ignoramus* were to pluck up his crop as soon as it appeared above ground, under the impression that what was then making its appearance was only *weeds*. We can hardly imagine that any one could possibly be so ignorant as this ; but is the ignorance of those who destroy their insect friends one iota greater?"

In 1862, when I was elected a corresponding member of the Entomological Society of Philadelphia, I communicated to Mr. Cresson, the secretary, the importance of forming a cabinet of insect architecture in connection with the extensive collections of the Society. I subsequently wrote a short article on the importance of forming a collection of this nature, and on the 6th May, 1863, Mr. Cresson wrote: "We have already started our collection of insect architecture, and if you can contribute any specimens to it we will be very thankful." And on the 15th June, 1863, he further adds: "The cabinet of insect architecture recommended by you has been fully started, and the progress already made bids fair for a large collection."

Now, I wish to urge the Entomological Society of Ontario to form a similar collection, as it is a most instructive and useful branch of Entomology, serving, when the specimens are properly determined and named, to trace the parent insect to its early mode of working, besides infusing a more correct system of study, and arriving at facts. All the old Entomologists took the greatest trouble and care in describing the habitations of insects, and why should we, at this advanced age of Entomological science, confine ourselves to the collecting and study of insects only. Systematists may go on writing books describing insects, larvæ, and their habitations --and such, no doubt, are very proper and necessary--but I hold that a

thoroughly correctly named collection of the natural habitations is more instructive than all the pictures or descriptions, however faithful or accurate they may be. Every species of insect has a peculiar mode of working in its early stages, and there is a kind of non-deviation in the work which a practical eye can trace, and say: "I can name the genus or species which produced that." I am fully aware that every Entomologist will not coincide with me, nor acknowledge that all Lepidopterous insects belonging to any certain genus produce cocoons of almost similar form, but I believe they do; and without dwelling on the reason or specific causes for recently transferring the following insects to distinct genera, suffice it to say that they were at one time included under one genus. I will now state why I should separate them on the structural dissimilarity of their cocoons, for on examining them and comparing them we discover a decided difference in their forms, that is to say, the cocoon of *Attacus cecropia* is greatly different from that of *A. polyphemus*, and the cocoon of *A. luna* is to a certain degree not like the latter, while that of *A. promethea* is always differently situated and formed from any of the former. To more fully strengthen my argument that almost all species of Lepidoptera copy each other, in the formation of the coverings made by the larva, I may mention that a cocoon found by me at Quebec, and which, from its likeness to that of *Cecropia*, I took to be that insect, was afterwhrds brought home by Mr. Bowles, and in due time produced *Samia Columbia*, a new species described by Mr. S. J. Smith in 1865. I could also give similar instances in the great family of *Hymenoptera*, but I shall leave any further remarks for another paper.

NOTES ON LEPIDOPTEROUS LARVÆ.

BY W. SAUNDERS, LONDON, ONT.

NOCTUA CLANDESTINA *(Drury)*.

Young specimens of the larva of this species were found last year, about half grown, under chips and logs in open fields early in May. They had evidently wintered in the larval state, and had but lately aroused from their winter's sleep. No description of the larva was taken until May 25th, when it was full grown.

Length 1·25 inch, cylindrical.

Head: medium sized, flattened, black, with two diverging whitish lines

down the front and one across, forming a small triangle ; a patch of dots of the same color on sides ; palpi whitish, tipped with black ; mandibles black.

Body above, dirty brown, with a faint yellowish tinge ; a dorsal line of of a paler hue, and a sub-dorsal yellow line, most distinct from fifth to twelfth segments, nearly obsolete on the anterior ones. The lateral lines are edged with a dull reddish color below ; and between them, from fifth to twelfth segments, is a series of elongated black spots, one on each side of the dorsal line on each segment, diverging from each other anteriorly, and shaded about their base with yellowish brown. On hinder part of twelfth segment is a patch of yellowish brown, edged behind with black. There is also a broken blackish line running through the spiracles.

Under surface paler, with a greenish shade and a few minute dark brown dots ; feet black, ringed with pale brown ; prolegs dull brown, dotted on the outside and tipped with black.

One specimen was much paler, nearly dull yellow ; and others of a much darker shade. One of these became a chrysalis May 26th.

GNOPHRIA VITTATA *(Harris).*

A spinous larva found under logs early in June in company with larvæ of *Arctians.* Also found occasionally on trees and shrubs later in the month ; feeds on lichens ; one specimen found full grown 30th June.

Length .75 inch ; head black, with a few small whitish hairs.

Body above, black, sprinkled with dots and short lines of yellow ; a dorsal row of yellowish dots from fifth to twelfth segments ; color paler on sides, approaching brown as it nears the under surface ; spines simple, not branched, all black and proceeding from slightly elevated black tubercles ; in some instances two spines arise from the same tubercle, one shorter than the other.

Under surface brownish yellow ; feet yellow, semi-transparent, lightly streaked with brown ; prolegs yellowish, faintly tipped with reddish brown.

HYPHANTRIA CUNEA *(Drury).*

Hairy larva, found in the middle of a wood under a log, July 14th. Fed it for a short time on lambs quarter, *Chenopodium album.*

Length 1.75 inches ; cylindrical ; head small, bilobed, black and shining, with a faint brownish streak between the lobes, scarcely visible above, and a few short brownish hairs.

Body black, with a slight shade of brown, and sprinkled all over with very minute whitish dots, scarcely visible without a magnifier. On each

segment is a transverse row of shining black tubercles, each emitting a tuft of hairs of the same color. On each side, from sixth to twelfth segments inclusive, is a double row of orange-colored spots -those composing the lower row more conspicuous than those in the upper one. There is also a faint continuation of these spots on segments anterior to the sixth, but they are scarcely visible to the unaided eye.

The under surface is paler, of a blackish brown color ; feet black and shining ; prolegs brownish, with a wide ring of shining black.

This larva, in common with most of the *Arctians*, was very quick in its movements. When disturbed it would run very fast. It shortly after entered the chrysalis state, and finally produced the imago ; but the date of its appearance has been lost.

MISCELLANEOUS.

Notes from the Far East. *Nematus ventricosus* very abundant here this spring. *Pieris rapæ* the same. *Meloe angusticollis* very abundant on Halifax common about the middle of May ; now totally disappeared. *Diptera* and *Hymenoptera* generally appeared early, and in tolerable abundance. J. M. Jones.

Halifax, N. S., June 4, 1871.

A Prize for Ontario Entomologists. In June, 1868, when in Brighton, Ontario; a lad brought me from the woods two large living moths, which I am almost certain were male and female individuals of *Eacles imperialis*, Drury, (so named by Dr. Packard, but better known as *Ceratocampa imperialis.*) They had, however, become so rubbed and broken in their efforts to escape, that they were worthless as cabinet specimens. Harris has a description of the several stages of this splendid moth in his "Treatise," giving June as the time of its appearance, and the leaves of the buttonwood as the food of the caterpillar. Packard states (Synopsis of the Bombycidæ, U. S.) that the larva has been taken on white pine in Rhode Island. The oak is also mentioned as one of its food plants. The Entomologists of Ontario should be on the look out for this moth, as it has not yet been placed on our list of Canadian Lepidoptera, though the allied genus *Dryocampa* is well represented in the Western Province. G. J. Bowles, Quebec, P. Q.

[Mr. Bowles is not quite correct in his supposition that this is the first capture of *E. imperialis* in Canada. In 1865 it was included in the

Addenda to the Entomological Society's second list of Canadian Lepidoptera, on the strength of a specimen captured near Belleville, Ont., and sent us by Prof. Macoun for identification—a locality not far distant from Brighton. We have never heard of any other specimens having been taken in this country, but we trust collectors will be on the look out for this magnificent insect. Drury, the original describer of the species, states that it breeds "twice in the year, in June and September. According to Abbott and Smith, the larva feeds on the plane tree (*Platanus occidentalis*, L.) oak, liquidambar and pine; some are tawny color, others tawny and orange; others green. They are furnished with long rigid hairs, and the second and third segments of the body are armed with two pair of short, erect, rugose horns." Dr. Fitch mentions the pine as its almost invariable food plant in the Northern States. We trust Prof. Macoun will keep a sharp look-out for the larva during his rambles this summer.—ED. C. E.]

ERRATUM.—In the CAN. ENT., vol. 2, page 157, the dimensions of the larva of *Sesia diffinis* is incorrectly given as "length 1-5 to 1-7th inches;" it should be 1-5 to 1-7 in.—that is, one-and-five-tenths to one-and-seven-tenths of an inch.—THEO. L. MEAD, New York.

PERSONAL.—Mr. F. G. Sanborn has recently accepted a Professorship in Practical Entomology, in the Bussey Agricultural School of Harvard University. He will still continue to be connected with the Boston Society of Natural History. Mr. Theodore L. Mead, of New York, has just started on a three months' collecting tour in Colorado, where he expects to obtain many new and rare species of insects; his address for the next two or three months will be Denver, Col.—Mr. G. W. Belfrage, of Waco, Texas, has set out on his expedition to New Mexico, as recently advertised in this journal. During his absence shares in his collections may be had at any time by paying the subscription ($25.00) to Swenson, Perkins & Co., 80 Beaver street, New York.—Mr. C. V. Riley, State Entomologist of Missouri, has left for England on a visit to his native land; we heartily wish him a pleasant voyage and safe return.

PAPILIONIDÆ.—Mr. Wallace ("On Natural Selection," p. 189) states that no less than 130 species of Malayan Papilionidæ are now known. The exceeding richness of the Malayan region in these fine insects is seen by comparing the number of species found in the different tropical regions of the earth. From all Africa only 33 species of Papilio are known; but as several are still undescribed in collections, we may raise their number to about 40. In all tropical Asia there are at present described only 65 species; in South America, south of Panama, there are 150 species belonging to a single genus and eight groups. The Malay species belong to three

genera and twenty groups; some of them are of enormous size, e. g. *Ornithoptera Priamus* expands 8.3 inches, and *O. Helena* 7.6 in.

WHY?—*The grand secret of successful collecting*, whether by day, dusk, dark or dawn, lies in one little word why? If the beginner, instead of clinging persistently to the delusion that the more ground he gets over the better will be the sport, would just ask himself, "Why, here?" Whenever he captures a decent insect, and would insist on a satisfactory reply or else a give-it-up from his inner man before leaving the spot, we should soon have a race of real insect hunters. I fancy I hear some one say: "Why, any fool knows that!" Exactly so; and "any fool" will doubtless keep up his character for stupidity by blundering on and neglecting to act on it. *Where there is one there are more*, is true in a general sense; hence the greater reason why the above interrogatory should be answered on the spot. "Why?" here asks a string of questions: Whence from? Whither bound? Was it a female on the mission of ovipositing? a male in quest of a virgin female?—fluttering about its food-plant?—on its way to some neighboring attraction?—on the wing of pleasure, enjoying the hot sunshine, the cool shade, or some other congenial atmospheric condition?—its proper time of flight?—seeking a place of rest?—*or*, was it disturbed, and in its flight flew it knew not where?—was it blown by the wind against its will?—under the influence of light?—or after somebody's sugar? DR. KNAGG'S ("The Lepidopterist's Guide," p. 78.)

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REMITTANCES

Received since issue of Vol. 3, No. 1.—M. S. R. Brighton, $1; J. M. J., Halifax, N. S., $1; D.W.B., St. Catharines, $1; H.B.B., Toronto, $1; W. H., Hamilton, $1; Rev. V.C., North Douro, $3; E.G., Three Rivers, P. Q., $1; T.W.H.R., Yarmouth, N. S., $1; D.McI., Allenford, $1; Rev. G.B., Clifton, $1; R.K., Dundas, $1; S.H., Boston, Mass., $1; A.W.W., Boston, Mass., $1; E.B., Boston, Mass., $1; P. S. S., Boston, Mass., $1; J. E. C., Holyoke, Mass., $1; G. M. L., Indianapolis, Ind., $1; C. S. M., Boston., Mass., $1; F. H. F., Needham Plains, Mass., $1; W. M., Hamilton, $1; W. H. D., Boston, Mass., $2; J. G. B., Quebec, $2.

EXCHANGES, &c.

COLEOPTERA, LEPIDOPTERA, &c.—Expecting soon to return to Europe, I should like to receive in exchange Lepidoptera or Coleoptera of Canada

and the United States for European. As a corresponding member of the Royal Entomological, Malacological and Linnean Societies of Belgium, and an honorary member of the Silk Supply Association of London, I am desired to procure such species as can be obtained from the United States and Canada. I should especially like to obtain specimens of Silk-worm Moths; and should also be thankful to receive birds' skins, eggs, and nests for Europe. Early correspondence is solicited, in order to effect agreeable exchanges. Specimens may be sent packed or pinned in cigar-boxes.—J. Q. A. WARREN, Chicago, Ill. (After June 12th, care of 54 East 12th street, New York, where all parcels may be sent.

LEPIDOPTERA.—Canadian Lepidoptera desired in exchange for British. E. H. COLLINS, *Daily News* office, Kingston, Ont.

PUPÆ AND OVA OF LEPIDOPTERA.—I am desirous to obtain, if possible, *live* Pupæ and Ova of certain Canadian and other North American Lepidoptera. Would purchase, or give in exchange, English or other European species. CHAS. GEO. ROTHERAM WEBSDALE, 78 High-street. Barnstaple, England.

AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

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The Canadian Entomologist.

VOL. III. LONDON, ONT., JULY, 1871. NO. 3.

REPORT OF MESSRS. W. SAUNDERS AND E. B. REED, ON THE COLORADO POTATO BEETLE—

Doryphora 10 lineata—Say.

LONDON, ONT., June, 1871.

To the Honorable John Carling, Commissioner of Agriculture and Public Works for the Province of Ontario:

SIR—In compliance with instructions from your Department, dated June 10th, 1871, "to visit, without delay, as many of the localities on the Western frontiers of this Province as are most affected by the ravages of the Colorado Potato Beetle; to examine the nature and extent of the attack; to make such experiments, with a view to the cure or arrest of the malady, as our observations and judgment might suggest, and to report to your Department the result of our labors, that the same might be submitted to the public forthwith, for general information;" we beg leave to submit the following Report:—

LOCALITIES.

We have visited a large portion of the Western frontier of the Province, and have also procured reliable information from many other localities throughout Western Ontario, and are thus enabled to form a tolerably accurate estimate of the spread of the insect, and also of the present state of the potato crop in those regions now affected by this pest.

NECESSITY FOR INVESTIGATION.

We are fully satisfied, from personal observation, that the current newspaper reports respecting the enormous numbers of these insects which have crossed into Canada from the State of Michigan are but little, if at all, exaggerated; and that the evils resulting from this invasion are already of sufficient magnitude to excite serious alarm respecting the safety of a crop which is so indispensable to all classes of the community; and we

apprehend that before the close of the season the natural increase of the insect will have extended the mischief throughout the greater portion of Ontario. The prompt action, however, of the Department, in endeavoring to acquaint the agriculturists of the Province with the best remedial measures to be used in this instance, will, we trust, result in effecting a saving of a material portion of the crop, even in the badly-affected districts. In making this Report, we have endeavored to condense it as much as is compatible with the objects we have in view, and to lose no time in placing it in your hands in a plain and popular form. It is intended, in the next annual report of the Entomological Society of Ontario, to give a complete history of the Colorado Potato Beetle from its earliest appearance, with a more detailed account of the mischief it has caused throughout the country; and also to treat at large of the various other insects injurious to the potato.

THE COLORADO, OR 10-LINED POTATO BEETLE.

FIG. 1.

Colors—(*a*) deep orange; (*b*) and (*c*) venetian red, inclining to cream color; (*d*) and (*e*) cream color and black.

The accompanying fig. 1 represents the insect in all its various stages, and will enable the reader readily to recognize it when found; *a a* the eggs, which are of a deep orange yellow, and are laid in patches usually containing from thirty to forty on the underside of the leaves; *b b b* the larvæ at different ages; *c* the chrysalis or pupa; *d d* the perfect beetle; *e* one of the wing cases enlarged, to show the lines more plainly.

The larva, which is at first dark reddish brown, becomes paler and

brighter in color as it matures. The head is black, and there is a ring of the same color on the second segment. There are also two rows of black spots along each side.

The perfect beetle is of a yellowish cream color, with ten black lines or stripes, running lengthways, and a few black dots on the head and thorax. There are three broods of this insect during each year, the last of which remains in the ground during the winter. Some idea of its enormous rate of increase may be gathered from the fact that each female deposits from 700 to 1000 eggs, and that these attain to the perfect beetle state within fifty days, so that the results from a single pair, if allowed to increase without molestation, would, in one season, amount to over fifty millions. The insect, in its several forms of egg, larva and perfect beetle, may frequently be found in company on the same potato vine.

ITS NATURAL FOOD.

This insect was originally confined to a comparatively small extent of country, in the region of the Rocky Mountains, where it fed on a species of wild potato, *Solanum rostratum;* but having suddenly acquired a taste for the cultivated potato, and adopting that as its principal food, it has gradually spread eastward, until it has invaded our shores. It feeds also readily on many other plants belonging to the order *Solanaceæ*, which includes the tomato and egg-plant as well as the potato—all of interest to the agriculturist—as well as many species of wild plants, such as Black Henbane, *Hyosciamus niger*, and Thorn-apple, *Datura Stramonium*.

THE THREE-LINED POTATO BEETLE.

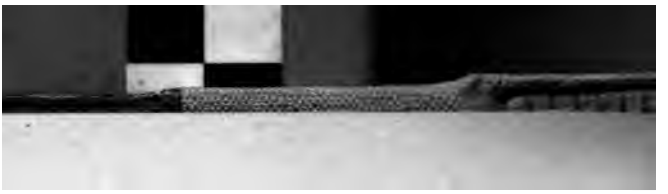
FIG. 2.

Colors—Pale yellow & black.

FIG. 3.

Colors—Dull white.

The Colorado, or ten-lined beetle, must not be confounded with the smaller *three*-lined potato beetle, *Lema trilineata—Oliv.* See figure 2—which has been common throughout Canada for many years past, and is, at the present time, unusually abundant in some districts, especially in the neighbourhood of Kincardine. The larva of this beetle (see fig. 3) is smaller, and may be readily distinguished by its disgusting habit of carrying its excrement on its back.



EXTENT OF DAMAGE.

We found that the districts most affected by the insect were those portions of the Province situated on the frontier, between Sarnia and Amherstburgh, and extending inland from twenty to forty miles; but we have obtained undoubted evidence of the fact, that in smaller but rapidly increasing numbers this pest has spread over a very large portion of the Province, embracing Bayfield to the North, the neighborhood of Toronto to the east, and over almost the entire portion of the western section of the country. It must be remembered, however, that those insects we have seen are of the first brood only, and as the season advances we shall, without doubt, receive reports of great injury sustained in many districts by the succeeding broods. Already several instances have come under our notice of parties who have been so discouraged by the utter destruction of their potato vines, that they have ploughed up entire fields and sown other crops in their place. We anticipate that the large amount of shipping daily passing down the Detroit river, and the continual movement of railway cars from affected districts, both in Ontario and the United States, to the eastern portions of the Provinces, will, by affording shelter and means of transport to the beetle, distribute this insect shortly over the entire coast line and portions of the country through which the railways pass.

ITS PROBABLE CONTINUANCE.

From all the information we have been able to obtain from competent observers in those Western States which first suffered from the depredations of this foe, we deem it highly probable that we shall have to contend with it for many years to come. In the course of three or four summers our agriculturists may expect that the insect enemies of this beetle, of which we already know some nine or ten to exist in Canada, and which prey upon the eggs and larvæ, will, in the natural order of things, so multiply as materially to check the further increase of the Colorado Beetle.

IS IT POISONOUS?

As many stories are current relating to the supposed poisonous character of this insect, we made it a special point to obtain all the information possible on this head, and we were unable to find the slightest evidence to sustain this popular belief, although we conversed with many persons who had handled and destroyed many thousands of the insects in their different stages, and also handled them freely ourselves with impunity.

We do not know of any insect belonging to the family *Chrysomelidæ*, of which this beetle is a member, possessing poisonous properties, hence we deemed it highly improbable, from the first, that there was any truth in the stories so widely circulated, and which have created so much unnecessary alarm.

ARTIFICIAL REMEDIES—PARIS GREEN.

The many Entomologists and Agriculturists who have experimented on this insect, with various poisonous and other substances, in those portions of the United States where it has been so destructive for some years past, concur in recommending the use of *Paris Green*, diluted with flour, ashes or air-slacked lime, as the best remedy known for destroying the insect, both in its larva and beetle state, without injuring the plant. The results of our experiments and investigations confirm this opinion, and this remedy is, no doubt, a reliable one, provided the *Paris Green* be of good quality. Our experience has also satisfied us that flour is a much better substance to mix the green with than either ashes or lime, as the insects eat it more readily, and, at the same time, it adheres more tenaciously to the surface of the plant, and hence is not so easily washed off by rain. We found good effects from a mixture of one part, by weight, of *Paris Green*, with 10 or 12 parts of flour, dusted lightly on the vines early in the morning, when the dew is on the foliage.

HOW BEST APPLIED.

Where only a small patch is cultivated, the mixture can be readily applied by means of an ordinary flour-dredger; but where larger quantities are grown, we would suggest the use of a round tin box, about nine or ten inches in diameter, and four or five inches in depth, with a tightly-fitting lid, and with a bottom either perforated with small holes, or covered with fine wire gauze. This should be attached, by means of a hollow handle, to a stick of any convenient length. With such an instrument, which may be obtained at a very trifling cost, a large piece of ground can be gone over in a short time, and the mixture applied almost as fast as the operator can walk.

QUANTITIES REQUIRED, AND PROBABLE COST PER ACRE.

After a careful estimate, we consider that three pounds of the *Paris Green*, mixed with its due proportion of flour (30 to 56 pounds), will, if economically used, be found sufficient for one acre of potatoes. Assuming fifty cents to be the ordinary retail price per lb. of *Paris Green*, every

application of the mixture would cost from two to three dollars per acre, exclusive of the labor. If the insect is very abundant, two or more applications may be required, as exposure to wind and rain will eventually remove the powder entirely from the leaves, rendering them liable to further attacks. Some discretion should be exercised in selecting a suitable time for using the mixture, which should not be applied during high winds, or immediately before a rain storm.

NOT DANGEROUS, IF CAREFULLY USED.

As this mixture is of a poisonous character, ordinary care should be used in handling it, to avoid inhaling much of the dust when applying it, to wash the hands after each application, to keep it out of the reach of children, and to exclude live stock of all kinds from fields where the poison is used. With these precautions no danger need be apprehended ; it does not injure the leaves to any appreciable extent, unless very heavily applied, and cannot possibly affect the potato itself. We make these remarks because we have met with several individuals who entertain a foolish prejudice against the use of this mixture, for fear that it might injure the potatoes.

OTHER REMEDIES TRIED.

We did not content ourselves with the use of *Paris Green* only, but experimented with as many other substances as the limited time at our disposal would admit of ; and, although we would not have the results here given to be considered as final in reference to the materials used, we trust they will be of value as indicating the most promising remedies for further trial.

ARSENIOUS ACID (Arsenic).—This chemical being much cheaper than *Paris Green*, and more uniform in its composition, we hoped it would have proved a practical and safe remedy. We tried it in the proportions of half-ounce, one ounce and two ounces to a pound of flour ; and while we are not prepared, from the few trials we have made, to entirely disapprove of its use, the results we have obtained point to the conclusion that where it has been used in sufficiently large proportions to destroy the insect, it has caused more or less injury to the leaves. In cases where *Paris Green* is not obtainable, this might be used as a substitute, in the proportion of one ounce to one pound of flour, which should always be colored with some black powder, such as charcoal or black antimony, so as to lessen the risk of accident from its use.

Another arsenical compound was also tested, known in commerce as *Powdered Cobalt*, or Fly-Poison. This was used in the same proportions as the last-mentioned, and with similar results, but owing to its higher price we do not recommend it for general use.

SULPHATE OF COPPER (Blue Stone).—A strong solution of this salt was tried in the proportion of two ounces to one gallon of water, and showered on the vines with a watering pot, without damage to either the insect or the plant.

BICHROMATE OF POTASH.— This is a poisonous substance, largely used in dyeing, and one which has attracted some attention in France of late, as a remedy for insects. We used it dissolved in water in the proportion of two ounces to three gallons of water. This killed the insects effectually, but, at the same time, destroyed the plants. Whether, in a more diluted form, this remedy could be effectively used without injury to the foliage, we are unable at present to say, but shall experiment further with it.

POWDERED HELLEBORE.—This powerful irritant, which is so effectual as a remedy for the *Currant Worm*, we tried without perceptible effect, both in powder and also mixed with water. Several other poisonous substances were also used with like results.

CARBOLATE OF LIME.—There are several preparations sold under this name, which we found to vary much in composition and character, and equally so in effect. We tried an article known as Dougall's, without any good result, but succeeded better with one prepared by Lyman Bros. of Toronto, a black powder manufactured, we understand, from coal tar.- This destroyed a large proportion of the larvæ, but we doubt whether it would kill the perfect insect; it is, moreover, used in an undiluted form, which would render its cost greater than that of the *Paris Green* mixture, so we see no advantage in using it, although the fact of its being less poisonous may induce some to try it who are prejudiced against *Paris Green*.

ASHES and AIR-SLACKED LIME, we found, had been extensively used by many of the farmers on the frontier districts, but, as far as we could see or learn, without any perceptible results.

HAND-PICKING.

This has been, thus far, the chief means employed in lessening the numbers of the beetle, and, where perseveringly followed, has proved

very successful; but it needs to be almost daily repeated, and is, therefore, exceedingly troublesome, and quite impracticable where a large quantity of potatoes are under cultivation. The usual method is to knock the insects off the plant with a piece of shingle, into a dish or small pail containing a little water; as they readily fall when struck, both larva and beetle may thus be collected in large numbers.

ARE ALL POTATOES ALIKE LIABLE TO ATTACK?

During the course of our inspection, we frequently met with gardens and fields containing two or more kinds of potatoes, and observed that in many instances one sort was very much more affected by the insect than the others. The *Meshannock* is particularly liable to attack, while the Early Rose and Peach Blow are less so; but where the latter are the only varieties planted, the insects do not hesitate to devour them. The only practical suggestion we can make in reference to this point is, that it might be well to plant a few of such sorts as are most liable to be injured, so as to attract the larger proportion of the insects to one spot, and thus enable the cultivator to destroy them with less labor and expense.

NATURAL REMEDIES.

American Entomologists enumerate fourteen insects which prey upon the Colorado Potato Beetle in some one or other of its stages. Eight of these we know to be common in Canada, and probably some of the others will also be found here. Of the insects we are now about to describe, the first four feed on the eggs and larvæ, the fifth upon the larvæ only, and the last two on both the larvæ and perfect beetle.

FIG. 4.

LADY-BIRDS.—The commonest of these is called the nine-spotted Lady-Bird (*Coccinella 9 notata*—Herbst.) See fig. 4.—It is a small, round beetle, of a brick-red color, with nine black spots on the wing cases, and may be found in almost every part of Canada.

FIG. 5.

Hippodamia maculata (De Geer.) The spotted Lady-Bird; see fig. 5. This is a small, pinkish beetle, marked with large black blotches.

FIG. 6.

Hippodamia 13 punctata (Linn.)—The thirteen-dotted Lady-Bird (see fig. 6) is somewhat larger than either of the preceding species, and has thirteen black spots on a brick-red ground.

Hippodamia convergens (Guer.)—The convergent Lady-Bird,

whose color is orange red, marked with black and white, is said to have been of immense service in checking the ravages of the Colorado beetle in some of the Western States. The larvæ of all these species are very fierce, and feed on both the eggs and young larvæ of both the Colorado and three-lined potato beetle.

FIG. 21.

The next insect belongs to the order *Hemiptera* (half-wings), the true *bug* family. It is the rapacious Soldier Bug *Reduvius raptatorius (Say)*—See fig. 21. Its color is light brown, and it attacks the larvæ only of the Colorado beetle.

We have detected another insect friend belonging to this family in the act of extracting the juices from the body of a young Colorado larva, into which it had thrust the long rostrum, or beak, with which all the members of the family are furnished. Its name has not yet been determined by us.

The next two friendly insects are known as *Carabidæ*, or Carniverous Ground Beetles.

FIG. 22.

Colors—Black, with coppery dots.

Calosoma calidum (Fabr.)—The glowing calosoma (see fig. 22) is so called from the appearance of its wing-cases, which are shining black, with six rows of sunken coppery spots. This beetle is easily found under stones or logs, in moist weather, in May and June. It is exceedingly active in its movements, and a valuable friend to the agriculturist.

FIG. 23.

Color—Dull black.

The murky ground beetle, *Harpalus caliginosus (Say)*—see fig. 23—is the last one on our list. It is of a dull black color, and may be readily recognized from the drawing. All the insects belonging to this family are carnivorous in their habits, and we shall doubtless find among them some other species attacking the Colorado Potato Beetle.

In some of the figures we have used, the insects have been enlarged, and in such cases the correct size is represented by a hair line at the side of the drawing.

POULTRY.

There is a great diversity of opinion as to whether poultry will, or will not, eat the larvæ of the potato

beetle, and if they do eat it, whether any injurious effects will follow. We obtained much contradictory evidence on this point. A few people asserted that some of their poultry had suddenly sickened and died, after eating freely of the insect, while others stated that their turkeys, ducks and fowls had eaten the larvæ greedily, and with perfect impunity. The evidence is so evenly balanced, that we are unable to give any decided opinion. We hope some further experiments will shortly be made, and a definite conclusion arrived at.

SUGGESTIONS.

Paris Green, which we regard as the most practical and efficient remedy for this insect pest, is, unfortunately, as found in commerce, a substance most variable in its composition. It is an arsenite of copper, and the best qualities contain about 60 per cent. of arsenic, on which its activity depends; but the inferior grades contain a much smaller per centage, and are proportionately less effective, and sometimes almost worthless for this purpose. It is highly important that the public be supplied with a good quality of this useful material, and at as low a price as possible, as an encouragement to its use; and we would strongly urge on the Department the expediency of making such arrangements with the wholesale dealers in Toronto as will enable farmers and others to obtain a reliable preparation at a stated uniform price. We would further suggest, that, for convenience sake, the *Paris Green* be made up in packages containing one pound each, with printed directions for its use, and cautions regarding its poisonous qualities.

We would also recommend the department to strongly urge upon farmers to plant in future only such quantities of potatoes as they can well look after. One acre, carefully cultivated and watched over, will probably yield more gross results than four or five acres, if neglected; indeed, wherever the beetle is numerous, negligence will be sure to be repaid by the utter destruction of the crop.

ACKNOWLEDGMENTS.

We cannot conclude our report without acknowledging the valuable assistance we received, during our tour of inspection, from many persons to whom we applied for information. Much anxiety appeared to be felt for the safety of the potato crop, and great satisfaction was expressed at the action of the Department in causing an investigation to be made. The officers of the various agricultural societies in the districts we visited

were most obliging, and did all in their power to aid us. In our annual report, to which we have before alluded, we purpose to acknowledge more in detail the individual services which were rendered. We would, however, here especially express our thanks to W. Wallace, Esq., Assistant-Superintendent G.W.R.R., for his kindness in obtaining much useful information for us from the various station masters on the line.

We have the honor to be, Sir,

Your obedient servants,

WILLIAM SAUNDERS,
Vice-President Entomological Society of Ontario.

EDMUND BAYNES REED,
Sec.-Treas. Entomological Society, Ontario.

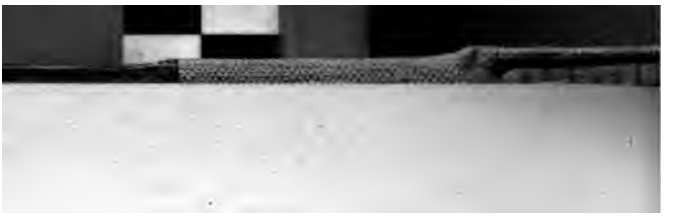
[NOTE. Seeing the importance of taking immediate action in carrying out the suggestions made in the above Report, the Department has effected such arrangements with a wholesale drug house in the city of Toronto as will enable farmers and others to obtain a reliable quality of Paris Green there, at 30 cents per pound. It will be put up in one pound packages, as suggested, with full directions for use, and may be purchased in quantities of not less than ten pounds, by remitting the amount of its cost to Messrs. Lyman Bros. & Co., of Toronto.]

DESCRIPTION OF HESPERIA CONSPICUA (EDW.).

BY PROF. H. W. PARKER, AMHERST, MASS.

Mr. Edwards describes and figures a female of this large species, from Michigan, in Proc. Ent. Soc., Phil. 1863. The following is a description of the male, collected by me in Iowa, July 4. The spots are numbered as in Mr. Edwards' account:

The secondaries, above and beneath, are like those of the female. Above, from the border of the primaries to near the base, the color is yellow, except the sexual dash and dark veining; an oblique line at end of the cell, from which a dark shade extends to the outermost spot; resting midway on this, a narrow shade runs from the first three spots along the subcostal vein. The sexual dash, with its spots, is formed of two confluent patches of black; the outer one is oblong, parallel and contiguous with the cell, its outer end slightly separated from the oblique cross line; the other patch is smaller and more oval, touches the basal



fourth of the first patch (in one specimen only the corner), and extends obliquely to the internal vein; outside of this the eighth yellow spot is not obsolete, but large, squarish, and confluent with the seventh.

Beneath, the smoky tinge of the inner margin of the primaries is replaced by dark brown between the base and the seventh and eighth yellow spots; the seventh is sharply defined, and the eighth shades off exteriorly. This dark-brown area (made up in part of a sub-triangular spot, its darker part oval, and representing the outer sexual dash above) cuts sharply against the cell. The costal border, the cell, and the whole of the secondaries, have a strong tawny tinge in a fresh specimen. The cross line at the end of the cell is visible, and a dark shade reaches outwardly to both the fourth and fifth spots; the cell is bisected lengthwise by a dark line. Ex. males 1-4—1-5. Females 1-5.

In a female specimen, likewise from Iowa, the secondaries beneath are suffused with the same tawny color as in the male. My males unquestionably belong to my female, and the female agrees well with Edwards' description and figure, whereas Mr. Scudder confesses that his does *not* in particulars that seem important.

HOW TO DISTINGUISH BETWEEN LIMENITIS DISIPPUS—Godt., AND L. URSULA, Fabr., IN THEIR PREPARATORY STATES.

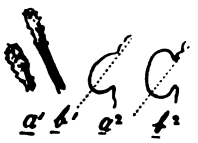
BY C. V. RILEY,

State Entomologist of Missouri, St. Louis.

It is not, I believe, generally known that, closely as these two insects resemble each other in the larval and pupal states, they may, nevertheless, be readily and invariably distinguished by the constant differences in the anterior horns of the former and in the hump of the latter. I was fortunate enough, the present summer, to have several larvæ of each species feeding, as also several pupæ of each hanging, at one and the same time; and with the exception of the characters here given, I do not think there are any other distinguishing features to be relied upon. On an average, the mature larva of *Ursula* is larger, the head is somewhat smoother, and the mamma-like warts on joint 5 more prominent, while the average size of its pupa is also greater; but, when a sufficient

number of individuals are examined, each species is found to vary so much in itself, as to render these unreliable as distinguishing traits.

FIG 24.



The accompanying diagrams (Fig. 24), which are sketched from memory, are, perhaps, a little inaccurate and exaggerated; but will serve to illustrate the true distinguishing traits at a glance —*a' a²* showing the larval horn and pupal hump of *Disippus*, and *b' b²* the same of *Ursula*. In the full-grown larva of *Disippus*, the horns on joint 2 are, on an average, but 0.20 inch long; while in *Ursula* they average 0.40, or double the size: in *Disippus* they are heavy, decidedly club-shaped, and generally covered with granulations or prickles to the base; while in *Ursula* they have a more uniform diameter, are more slender, with fewer prickles at the end, and with the basal half generally quite smooth and highly polished. In the pupa of *Disippus* the hump is less regular, with the upper edge less rounded than the lower, so that an imaginary line run through it as at *a²* leaves the larger portion below. In the pupa of *Ursula*, on the contrary, the hump is quite regular, the upper edge being, in outline, almost the counterpart of the lower, so that the same imaginary line would leave the larger portion above.

I have not my library at hand, and cannot tell whether Boisduval, Smith and Abbott, or any other authors have pointed out these distinguishing characters; but I have an impression that they have not, and more modern authors certainly have not.

London, Eng., July 13th, 1871.

[Mr. Riley's friends will no doubt be glad to learn, from the date of the foregoing article, that he has safely crossed the Atlantic, and that, though amongst old friends and old haunts, he has not lost his interest in the investigation of the insects of this continent. We wish him much enjoyment in his visit to his native land, and a safe return to his valued labours in the Western world.—Ed. C. E.]

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

LITHOCOLLETIS.

(For the generic characters, see Stainton's Nat. Hist. Tineina, vol. 2, or Dr. Clemens' Paper in the Proc. Acad. Nat. Hist., Phila., Nov., 1859.)

THIS genus comprehends a large part of the genus *Argyromiges* Stephens, and is one of the largest among the Tineina. The number of described European species is very great; but in this country, so far as I am advised, but 27 species have heretofore been described. Of these, Dr. Fitch *(Reports, vol. 5)* describes 7, one of which, *L. (Argyromiges) robiniella*, is re-described by Dr. Clemens *(loc. cit. supra)*, it having been originally described by him in an English publication. Dr. Clemens *(loc. cit.)* describes also 17 new species; and Dr. Packard, in his "Guide," describes 3 additional new species. I propose, in these papers, to catalogue such of the above-described species as I have met with in Kentucky (near to Cincinnati, Ohio), with notes upon their habits, variations, &c., and to describe such new species as I have met with.

The genus presents, in the larval state, two distinct forms.

GROUP 1st.—Larva cylindrical, with distinct thoracic, ventral, and anal feet. It mines the *under* surfaces of leaves, and the complete mine is tent-like, and the leaf more or less drawn or folded.

GROUP 2nd.—Larva flat; apparently, but not really, apodal. It mines the *upper* surfaces of leaves, and the mine is usually flat, or simply a little drawn or puckered along the centre, and a little tent-like. But the rule is not invariable that the mine and miner of the upper surface is flat, and the miner of the lower surface cylindrical, and the mine tent-like. There are exceptions to both sorts of mine and miner. And from not being aware of these exceptions, Dr. Clemens *(Proc. Ent. Soc. Phila., 1863, v. 2, p. 8)* criticises a species *(Anacampsis robiniella)* which he says does not exist. But I have now before me as I write numerous specimens of the larva as described by Dr. Fitch. The mine, however, is *as yet* flat. And I have other instances of the other case, cylindrical larvæ in a flat mine on the upper surface. These larvæ are usually marked with a translucent spot on top of each side of each of the first three segments following the head, and with a transverse spot on those and the following segments. This *macula* is, in form, a thin double convex, an ellipsoid, or a parallelogram, and is

either hollow or not, according to the species. These markings change at the moultings sometimes, but I have never found any variation in the markings of the full-grown larvæ of a species among themselves, though sometimes they differ in larvæ from different species of plants which yet produce the identical imago. The mines, likewise, of the same species, do not vary essentially upon the same plant, nor usually upon different plants; yet sometimes different mines upon different kinds of leaves produce the same imago. Examples of these variations will be given further on. Usually, the larva of a species is confined to a single species of plants, or if it mines the leaves of more than one species they are generally closely allied ones; but sometimes it happens that the same larva—or one producing the same imago—mines the leaves of widely different plants.

It frequently happens that the same plant or even the same leaf is mined by more than one species of larva, and I have seen upon the same locust leaf *(Robinia pseudacacia)* the mine of *Lithocolletis Robiniella*, Clem., *Parectopa Robiniella*, Clem., and another mine, which is, perhaps, that of *Anacampsis Robiniella*, Fitch, though I have not bred the imago; and there is still another miner (of the upper surface) which makes a white, tent-like mine, but with the imago of which I am not acquainted as yet.

Usually a mine is tenanted by only a single larva, but as the mines spread they frequently unite. There are, however, among the larvæ of the 2nd group, some which occasionally, and others which almost invariably, have several larvæ even in the very young mine, and I have seen fifteen larvæ in a mine scarcely a line in diameter.

With very few exceptions, the pupa state is passed in the mine, the exuvia being left partly within and partly without the mine by the emergent imago. A few instances only are recorded in which the larva leaves the mine to become a pupa; and Dr. Clemens has recorded a single instance, that of *L. crataegella*, in which the larva sometimes leaves an old mine and forms a new one.

SECTION A.

SPECIES WITH THE GROUND COLOR WHITE.

Div. 1st.— Some portion of the wings of some shade of yellow.

Sub-div. a. No apical spot—no basal streak.

* Wings marked with fasciæ.

1.— *L. hamadryadella*, Clem., *Proc. Acad. Nat. Sci., Phila.* 1859.

There is considerable variation in the distinctness and disposition of

the markings of this species, especially about the basal portion of the wings, where the black markings vary from mere dusting to distinct narrow lines or fasciæ. Perhaps Clemens' variety No. 3 is the most distinctly marked form, but there is no such thing as a distinct and separate *variety*, as the variations are of all kinds between the extremes.

The larva is of the second group, and the mine is an irregular whitish blotch on the upper surface of the leaves of different white oaks *(Quercus Alba* and *obtusiloba)*. The pupa lies on the upper surface under a thin coverlet of silk. Imago in April, May and July. *Alar. ex.* nearly ⅓ inch. Common—Pennsylvania—Kentucky.

There is another mine of a very distinct species, hereafter to be described, on the upper surface of the leaves of the same plant, and sometimes both occur upon the same leaf. Seldom more than one larva in a mine.

2. - *L. tiliacella. N. sp.*

Glistening, snowy white; middle portion of the anterior wings from near their base to the base of the ciliae pale golden, which is produced along the costa to the base—three broad silvery white fasciae dark margined internally; the dark margin of the third fascia widely interrupted in the middle, and the pale golden very indistinct, sometimes not visible, behind it; the second fascia is about the middle of the wing. *Al. ex.* ¼ inch. Kentucky—rare. Larva of the *first* group, white, covered with dispersed longish hairs. Mine on *upper* surface of *Tilia Americana* (the Linden). Small, circular or ovate, brownish, mottled with whitish; not visible underneath until the lower cuticle dies. This is one of the anomalous mines and larvæ before referred to.

3. *L. lucetiella*, Clem., *loc. cit. supra.*

Besides the markings mentioned by Dr. Clemens, nearly all my specimens have the silvery band dark margined strongly by a dorsal black streak, and have also a distinct black costal spot at the base of the ciliae. *Al. ex.* ¼ in. nearly. Pennsylvania and Kentucky. Common larva of the 1st group—pupa in thin whitish silken cocoon.

Mines the under surface of leaves of *Tilia Americana*. It first separates the lower cuticle, between two veins, over the whole surface of the mine, and then picks out the parenchyma in specks above, so that the incomplete mine resembles and may be mistaken for that of *L. tiliacella*, but the perfect mine is white upon both surfaces.

Sub-div. b. With an apical spot—no basal streak.

* Costal and dorsal streaks, but no fasciae.

4. *L. Clemensella. N. sp.*

Silvery or glistening white. Antennæ annulate above with brownish. Apical half of the anterior wings pale golden, with four silvery white costal and two dorsal streaks all dark-margined internally. The dark margin of the first costal streak distinct, oblique, and produced along the costa towards the base. The first dorsal streak opposite to the second costal, oblique, pointing to the third costal. *No basal streak.* Apical spot black, nearly circular. Hinder marginal line at *the base of the dorsal ciliae brownish, broad, continuous with the hind margin of the second dorsal streak, and reaching to but not passing around the apical spot;* ciliae silvery-tinged with pale golden. *Al. ex.* ¼ inch. Kentucky—common. Differs from the next species, *L. lucidicostella*, in the points indicated by the italics, and is, perhaps, a little smaller. Though the imago is common in April and May, and I have made diligent search for the mine, I have never found it.

I have taken the liberty of naming this pretty species in honor of the late Dr. Clemens, who has done so much for this branch of American Lepidopterology.

Sub.-div. c. Both apical spot and basal streak.

* No fascia, but both dorsal and costal streaks.

5. *L. lucidicostella*, Clem., *loc. cit. supra.*

Larva of first group. Tent mine on the under surface of the leaves of Sugar tree (*Acer Saccharinum*) and sycamore? (*A pseudo-platanus*).—Imago in April, May, July and August. Abundant. *Al. ex.* ¼ inch, large. Pennsylvania, Kentucky and Alabama.

L. Argentifimbriella, Clem., is described *loc. cit. supra* and *L. quercialbella*, by Dr. Fitch, *in vol. 5 of his New York Reports;* and both are said to mine the leaves of oaks, but I have never found either in Kentucky, nor have I ever seen them at all. Are they the same? From the descriptions I cannot see wherein they differ.

L. Argentifimbriella and *L. lucidicostella* are described by Dr. Clemens in the same paper, and no doubt they are different species. Yet the differences indicated by the descriptions are differences of degree, that is, of intensity and extent of the markings rather than of kind, that is, of location and pattern of coloration; and I have species of *L. lucidicostella*, which seem to me to meet the requirements of either description.

6.- *L. Caryae-albella. N. sp.*

Head palpi, tuft, antennæ and thorax silvery white; basal portion of the wing (within the costal and dorsal streaks) silvery white, *with a wide pale golden basal streak along the costal margin from the base to the first costal streak.* The basal white portion in some lights suffused with pale golden. Apical two-thirds or more of the wings pale golden, with four silvery costal and two dorsal silvery streaks, all dark; margined internally. The first dorsal large oblique, opposite the first costal, which is smaller: *their dark margins uniting at an acute angle on the fold*, the streaks themselves being scarcely confluent. Second dorsal opposite to and larger than the second costal; its dark margin wide. Third and fourth costal streaks small. Apical spot small, black; hinder marginal line at the base of the ciliæ, brown. Ciliæ pale, fulvous. *Al. ex.* ¼ inch. Larva unknown. Mines the under surface of the leaves of hickory trees *(Carya alba).* Mine ovoid, tent-like. The parenchyma is eaten off of the upper cuticle in a ring, leaving a green spot in the centre, which is then eaten off. The pupa is contained in an oval cocoon made of frass. Imago in July—rare.

Very distinct from *L. lucidicostella*, the main differences being indicated by the italics above.

BOOKS RECEIVED.

It is now several months since we have had space to acknowledge the various publications that have been kindly sent us by authors and publishers; this omission has arisen, not from any want of appreciation of the kindness of the donors, or the slightest intention of being discourteous, but from the fact that our journal has been published at longer intervals than previously, and consequently the pressure upon its limited pages has been greater than ordinary. Our observations now must necessarily be brief, as we have fallen so deeply into arrears.

Characters of Undescribed Lepidoptera Heterocera, and *A List of Hymenoptera, collected by* J. K. Lord, Esq., *in Egypt, in the neighbourhood of the Red Sea, and in Arabia.* By Francis Walker, F.L.S. London: Janson. 1869-71.

The former of these works, by our diligent friend, Mr. Walker, contains descriptions of 196 new species from various parts of the world, including

several from North America; the latter gives descriptions of new species and references to nearly 300 species, chiefly of Aculeate Hymenoptera.

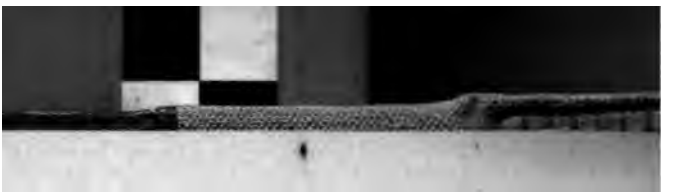
Record of American Entomology for the Year 1869. Edited by A. S. Packard, jun., M.D. Salem: Naturalists' Book Agency. (8vo. pp. 62. $1.)

We were very glad, indeed, to receive this second issue of a most useful work, and trust that we shall soon have the pleasure of announcing the publication of the third volume containing the "Record" for 1870. The part before us contains references to the articles or notes of fifty-two American Entomologists, and to the descriptions of no less than three hundred and thirty-five new species of North (and Central) American insects. Among the Entomologists we notice the names of ten Canadians, whose articles, together with those of several of our friends in the United States, have for the most part appeared in the pages of the CANADIAN ENTOMOLOGIST. We cannot but feel highly gratified at the success which our little publication has achieved as shown in the pages of the "Record;" and we trust that future issues will manifest no falling off in the numbers and zealous work of our friends and correspondents. The "Record for 1869" contains notices of the Hymenoptera, Lepidoptera (Heterocera), Arachnida and Myriapoda, by the Editor, Dr. Packard; Lepidoptera (Rhopalocera) and Orthoptera, by Mr. Scudder; Diptera, by Baron Osten Sacken; Coleoptera, by Dr. Horn; and Hemiptera and Neuroptera, by Mr. Uhler,—all well-known and eminent Entomologists.

MISCELLANEOUS WORKS.

"Le Naturaliste Canadien," vol. iii., No. 6, May, 1871; "The Canadian Journal," Toronto, May, 1871; "The Canadian Naturalist," Montreal, Sept., 1870; "Proceedings of the Boston Society of Natural History," vol. xiii., 1869-71; "Newman's Entomologist," No. 90 (from Mr. Reeks); Hardwicke's "Science Gossip," May, 1871; "Nature," No. 80, vol. iv., May 11, 1871; "The American Agriculturist;" "The Rural New Yorker;" "The Prairie Farmer;" "The Maine Farmer;" "The New York Sun;" "Arthur's Home Magazine" and "The Children's Hour;" "The Horticulturist;" "The Canada Farmer;" "The Churchman's Magazine;" "The Canada Bookseller;" "The Journal of Education;" "The Canadian Poultry Chronicle."

ERRATUM.—In the last number of the CAN. ENT., vol. iii., p. 23, 7th line from the bottom, for *C. Susinella*, Higa, read *C. Susinella*, Heyden.



EXCHANGES, &c.

COLEOPTERA, LEPIDOPTERA, &c.—Expecting soon to return to Europe, I should like to receive in exchange Lepidoptera or Coleoptera of Canada and the United States for European. As a corresponding member of the Royal Entomological, Malacological and Linnæan Societies of Belgium, and an honorary member of the Silk Supply Association of London, I am desired to procure such species as can be obtained from the United States and Canada. I should especially like to obtain specimens of Silk-worm Moths; and should also be thankful to receive birds' skins, eggs and nests for Europe. Early correspondence is solicited, in order to effect agreeable exchanges. Specimens may be sent packed or pinned in cigar-boxes.—J. Q. A. WARREN, Chicago, Ill.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

ADVERTISEMENTS.

CORK AND PINS.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

CANADIAN ENTOMOLOGIST, Vols. 1 and 2.—We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

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AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

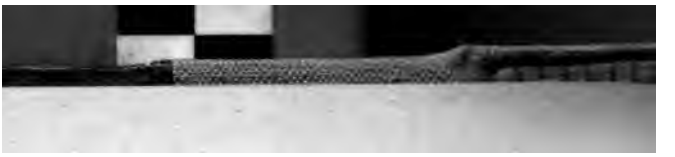
VOL. III. LONDON, ONT., AUGUST, 1871. NO. 4.

ENTOMOLOGY. No. II.

BY WILLIAM COUPER, MONTREAL.

In a former paper, I have briefly referred to the peculiarity of nest structure made by the larvæ of our large Lepidopterous Nocturnal insects,* in order to show that an attempt should be made to separate species on the similarity of form and texture of these structures. No doubt, when Entomology becomes thoroughly studied throughout the Dominion, much of the confusion in our present generic classification will be removed by means of investigations into the early history of larvæ and imagines of the many genera. True, this may be pronounced a theory; but when I find

* Fitch, in his Report for 1859, gives some pertinent remarks regarding the nomenclature of *Attacus cecropia*. When Linnæus first noticed this moth in the cabinet of Queen Ulrica, it was at that time the largest and most sumptuous of the kind known to him, and he named it as above, but Sir James E. Smith and latterly Dr. Harris have stated that the Linnæan generic and specific nomenclature are inexplicable. Fitch adds that "the name *Attacus*, meaning elegant, or connected to the Athenians, was originally given by Linnæus to a section or sub-genus of his group BOMBYCIDÆ, having the wings expanded when at rest. Schrank afterwards gave the name *Saturnia* to the same insects. Germar subsequently revived the original Linnæan name, but most authors still continue the name proposed by Schrank. Duncan (Jardine's Naturalist's Library, vol. vii.) has recently proposed dividing these insects into quite a number of genera. Plain, and in the main judicious as his arrangement of them is, he, in our view, improperly ignores the name *Attacus*, and unfortunately gives an erroneous location to some of the species.—Thus our American *Cecropia* and *Promethea* are the two species which he figures and fully describes as illustrating his genus *Hyalophora*, yet, as its name implies, this genus is characterised as having large hyaline glass-like spots on the middle of the wings. But no vestige of such spots exists in either of these species. The author has evidently been misled by figures, presuming the white spots represented in the centre of the wings to be hyaline, whereas they are opaque. A new situation must therefore be assigned to these two insects." Fitch further states that "*Cecropia*, *Promethea*, and the East Indian species named *Cynthia* of Drury, present a striking likeness to each other both in their preparatory and perfect states;" and he adds that "it is a remarkable feature in the Insect Fauna of this country that we possess such a number of large showy moths of the group *Attacus* of Linnæus. * * * * * we have in the State of New York alone eight of these elegant moths." At page 136 he remarks that our *Luna* "is almost identical with the



facts pointing toward these objects, I only ask the intelligent student to select a group for study, and when he concludes his investigations, let us have the matter fully explained. But before he can investigate cocoons or other nest forms of any particular genus, it is necessary that a collection be made of the various structures that contain either the living pupa or nymph. These should be preserved in separate boxes, and those specimens which his knowledge leads him to suppose belong to identified genera should be kept in such condition as to accord with the position in which he originally found them. This is the proper course to follow in investigating nest-structures of insects, which I claim will lead to the correction of many errors in our present classification, and place in their proper position many species that are now arranged under wrong genera. If this plan is carried out, the student will be rewarded with instructive lessons and discoveries of the greatest interest to science. This was the system commenced and partly worked out by the late lamented Benjamin D. Walsh, of Illinois, whose investigations of insect life were of the highest order; indeed, much of the present advanced state of the science in America is due to him. When my few illustrations and descriptions of insect architecture appeared in the *Canadian Naturalist*, he was the first to notice the matter and send me additional information regarding the species; and as I consider his remarks of value, I give them here as an addenda to said descriptions.

"No. 1 (see "Canadian Naturalist and Geologist," Dec. 1865, p. 461), except in being slightly smaller, strongly resembles the nest of *Eumenes fraternus* Say—a very common insect here. I have bred the female imago from the nest, and some that I broke open in the summer contained numerous green caterpillars, enough, I should judge, to feed the larvæ to maturity. I do not believe any wasps that are not social feed their larvæ after they are hatched out. The use of the short tube, which,

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Chinese species named *Selene* by Dr. Leach;" and regarding the *Polyphemus*, which is our most common species, he says that "it is remarkable that two insects which are so similar in their preparatory states that their larvæ differ only by slight and unimportant marks, and their cocoons cannot be distinguished from each other, still come to be so unlike each other in their perfect state as is *Polyphemus* and *Luna*. These facts show that the metamorphoses of the insects of this order are not so accurate a guide to their systematic arrangement as many have assumed them to be."

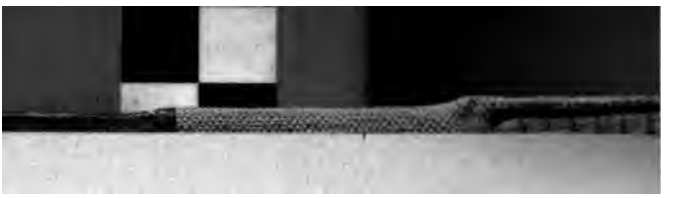
I have some reason, on another ground, to divide *Promethea* from *Cecropia* on cocoon form alone; and no doubt when the American species constituting the Linnæan genus *Attacus* are properly studied, great differences will be discovered, not only phytophagically but also in the internal structure of their larvæ.

when plugged up with clay, assumes the appearance of a button, is probably to prevent the caterpillars first enclosed in the nest from escaping before the full complement of food is made up."

"No. 2 (*Can. Nat.*, Dec. 1865, p. 461) is the nest of a wasp belonging to *Pompilidæ*, and differing from true *Pompilus* in having the front legs of the female nearly smooth. I have bred four or five different species from nests of similar structure, most of them found under dry bark, but one species occurring always under logs where the ground is moist. One of the former species is largely infested by an undescribed ichneumon fly belonging to the genus *Mesostenus*. The kind you figure is the smallest kind that I have bred from, some kinds being twice as long." In a subsequent communication, Mr. Walsh states that "the insect that forms the cell No. 2 belongs, I believe, to St. Fargeau's genus *Anoplius*: and on account of the legs being unarmed in the female he concludes it to be 'parasitic' in his sense of the term, or what Hartig calls an 'Inquiline,' and I have called in English a 'Guest-fly.' It is plain, however, that the reason why the legs of the female are unarmed is because it builds a clay nest and does not dig one out either in wood or in the ground. For the same reason, our common mud-wasp (*Pelopæus lunatus* Fabr.) has the legs of the female but very slightly armed with spines."

It will be seen from the above, that Mr. Walsh has bred four or five species belonging to the genus that produced my nest No. 2, and that the nests were all of similar structure, but these species, he adds, differ from the true *Pompilus*, by having the front legs of the females devoid of spines. I am sorry that it is not in my power at present to obtain additional information regarding the species occurring in Canada; but it may be safely inferred that they do not belong to *Pompilus* proper. The habits of these insects differ, as he states, in that the majority of the species build under dry bark of trees, while one species constructs cells under logs, &c., in damp places. It may be found that this difference is a selection to suit the larva-food which may be of another kind from that found in the cells made under bark. Many of the mud-building wasps that construct dry cells provide their larvæ with caterpillars and spiders, which the parent insect stupefies with a kind of aculeate poison that keeps them fresh for many days. It is, therefore, probable that the similarly-formed cells found under logs in damp, muddy places, may be supplied with a larva-food requiring moisture to keep it fresh while the larvae are feeding.* It would please me greatly, if some young Entomological student of Ontario

* During the progress of these articles, it is my intention to make occasional remarks on the similarity of nests formed by Canadian Insects, embracing distinct genera in the



attended to this enquiry. The insect builds commonly in muddy places on river banks, such as the Don, near Toronto, and Rideau, near Ottawa, where I found the cells quite common in the autumn; but no doubt they can be found under logs near any of the smaller rivers in Ontario.

I pass now to another subject—The Report of the Fruit Growers' Association of Ontario, to which is appended a Report of some of the Noxious Insects of Canada. I am glad to notice that Ontario takes the lead in these useful and instructive matters; but what in the world are the Fruit Growers about in offering such large prizes for the dead bodies of so many specimens of *Conotrachelus nenuphar?* The Report states that thirteen persons collected last year 13,653 bodies of this weevil, for which the Association may have paid upwards of sixty dollars. Now, I ask any person who has studied this insect, or the habits of the family to which it belongs, if he discovered any natural check on its increase more than any other species of *Coleoptera?* During my residence in Ontario, I have not, but, on the contrary, know that they have a prolific year like every other creature on this earth. Well, say that next year will be its prolific year, what a drain would be made on the funds of the Association, provided a person was lucky enough to discover a metropolis of the insect, as I did several years ago at Toronto! They occupied a number of choke-cherry trees which grew on each side of the road that divided the Allan from the Ridout property, north of Queen-street. At the rate offered to-day by the Association for so many of their bodies, I could, at that time, have easily made twenty dollars per day. This weevil occurs on all cherry and plum-bearing trees growing in the wilds of the west; and I also found it destructive on the butternut growing in the Don valley, where it attacks the fallen fruit, in which it undergoes its changes within the decayed nut on the surface of the ground. I am afraid that this pest has too great a latitude in the west, and it will be difficult to lessen them until we are thoroughly acquainted with the various fruits and nuts which serve to propagate them; indeed, not even then can we be rid of them, unless attention is paid to the destruction of all the fallen fruits which are found under the trees on which they occur. *Conotrachelus nenuphar* does not appear to be very destructive to plum trees in the districts of Quebec, Montreal, or St. Johns, about twenty-seven miles south of this city, where plums are largely cultivated.

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present classification. Many of these species are considerably misplaced according to my theory but I am determined to make no statement that cannot be upheld by architectural form and structure.

The *Curculionidæ* are generally hardy insects, and widely distributed. Cold does not affect them much, as we find species recorded as inhabiting temperate zones, ranging and occurring abundantly in northern latitudes. I make a suggestion, which, if carried out, would greatly advance our knowledge of this extensive family, of which, I am sorry to say, we know little or nothing:—That each of the Coleopterists of Ontario devote a season to the study of at least one species of *Curculio*—first arranging, at a meeting of the Society or agreeing by correspondence, on the names of the species selected for study—that is, that an understanding may be had in order that everyone is to take up a separate species—each student to make a report to the Entomological Society of Ontario sometime in the autumn. Fitch, in his Report for 1859, p. 158, says that "we are not certain as to the species of weevil which produce the grubs in our American hazelnuts, walnuts and acorns." On the 31st March, I discovered the acorns of the white oak, growing on the Mountain near this city, to be infested with a Coleopterous larvâ. These acorns remained under the snow during winter, and I have no doubt that they will produce weevils. The larvæ, at the above date, were of three sizes, and quite vigorous. Color glossy white, the young purely so, but the larger specimens are dotted with numerous black dots arranged transversely on the segments. Head and thorax chestnut color, but in some specimens a black square internal spot occurs on the centre of the dorsal region; this spot has an inter-cutaneous movement when the animal creeps. When these acorns are examined, a small circular hole may be noticed on the side of the nut, made by the parent for the deposition of its eggs; but in many specimens the hole is so nicely closed by the larva from within, that it requires a very expert eye to detect the orifice. This is but one of the many curious stratagems described by Kirby and others. Some of the larvæ which I brought home have begun to spin silken cocoons within the acorns; and if I succeed in breeding this insect, the readers of the ENTOMOLOGIST will learn it in a future paper.

THE GOOD EFFECTS of Entomology are numerous: patience, perseverance, and punctuality are essential for successful collecting; memory, discrimination, and logical reasoning are necessarily cultivated; early rising is encouraged; the mind and body of youth find occupation; temptation to immoral pursuits loses its effect; and liberality with a desire to assist brother collectors is generally engendered, sometimes because it is pleasant, at others because it pays better than greediness.—*Knaggs.*

HINTS TO FRUIT GROWERS.

Paper No. 3. By Wm. Saunders, London, Ont.

Figures Nos. 25, 26 and 27 represent the caterpillar, chrysalis, and perfect insect of the grape-vine sphinx, *Charocampa pampinatrix*. The young larvæ, varying in color from green to pale lilac or red, are now (August 1st) very common, and may be easily recognised by reference to the figure; for although the ground-tint of the body may vary, the dots and lines remain about the same. Its habit, too, of drawing its head with the second and third segments into the fourth, gives it a distended appearance anteriorly which is very characteristic. When full-grown, the caterpillar is some two inches in length, green, and covered with many small yellow granulations. On the back is a row of seven dots, varying in tint from very pale lilac to red, and on each side of these there is a yellow line or stripe extending from near the head to the base of the caudal horn; while the sides of the body are striped obliquely with pale yellow. These caterpillars are great eaters: and did they appear in swarms, as is the case with many others, they would cause immense damage; but as the eggs are laid by the parent moth singly, and not often many on the same vine, the rapid growth of the foliage during the warmer months will, on a large vine, almost make up for any defoliation caused by this larva. In young vineyards or gardens where the vines are small serious injury is sometimes done by these voracious creatures, one of which, when nearly full-grown, will strip a young vine clean of all its foliage in two or three nights.

We know of no readier way of fighting this foe than by hand-picking. When the foliage is sparse, the destruction they cause will lead to their ready detection, and where it is dense, they may be discovered by their large dark brown castings on the ground under the vines on which they are feeding.

Nature, which is seldom at fault, has provided a remedy to supplement man's agency in the shape of a friendly parasite, a small fly, which is shown here both magnified and of its natural size (see fig. 28), and whose progeny feed within the bodies of their victims, and finally destroy them. Before attaining full growth in these instances, the larvæ usually begin to look sick, and there is a sluggishness apparent in their movements, when soon the body becomes covered with little oval white cocoons, formed by the young grubs

Fig. 28.

Color Black.

FIG. 25.

Colors green, yellow and lilac.

FIG. 26.

Colors yellowish and brown.

FIG 27.

Colors olive green and grey.

which have eaten their way out through the skin of their victim (as shown in fig 29), from which, in about a week, the little flies escape, bent on their errand of mercy to the vine-grower. Discriminate here between friends and foes, and never destroy an infested larva.

FIG. 29.

Should all things work smoothly with the caterpillar, its life-history not being interfered with by either parasites or vine-growers, then, when full-grown, it descends to the earth and constructs a slight cocoon, by drawing loosely together a few leaves or other material and binding them with silken threads, in which in three or four days the change to chrysalis (see fig. 26) takes place, and which finally gives birth to the beautiful green moth shown in fig. 27. For further details regarding this insect in all its stages, the reader is referred to "The First Annual Report on the Noxious Insects of the Province of Ontario," which appeared in the Report of the Commissioner of Agriculture for 1870.

THE FALL WEB WORM.

A serious pest just now affects the apple tree—I refer to the "fall web worm," *Hyphantria textor*, an insect which has found its way into this Province from the Eastern States within a few years past, and is rapidly spreading. It is by no means confined to the apple, but is equally destructive to the cherry—we have also occasionally found it on the blackberry as well as on several different kinds of forest trees. At a distance, it appears as if the tree or branch infested had been suddenly blighted, the leaves have such a scorched and withered look: but on closer inspection you find the branches enclosed in a slight silken web, by means of which many of the leaves are drawn towards the stem. The upper surface and pulpy portion of the withered leaves have already been consumed by this spoiler; and here and there, where some green portions still remain, groups of ever-hungry, hairy caterpillars are busy at work. In June or July, a small, pure white moth, or miller, has laid a cluster of eggs on a leaf near the extremity of one of the branches, and from this has originated the host of mischief-makers. Before attaining full growth they give up their social characteristics, and scatter far and wide, feeding singly on almost anything they meet with. When mature, they are a little more than an inch long, of a bluish black color, with a wide band of a paler hue along each side, and a few clusters of whitish or reddish hairs arising from little knobs or tubercles, which are arranged

in a transverse row on each segment or ring of the body. They are of very active habits, running briskly when disturbed.

Hand-picking is the best remedy for these also: go carefully over the infested branches and give no quarter.

REARING BUTTERFLIES FROM THE EGG.

By W. H. Edwards, Coalburgh, West Va.

I give herewith the conclusion to my experiments with *Ajax* and its varieties. The *Telamonides* larva spoken of in my communication of 27th Feb. (vol. ii., p. 163) as having lived over the winter, on the 1st of April, 1871, produced male *Telamonides* (all the rest had yielded *Marcellus* in 1870). The *Marcellus* larvæ were mostly lost at the burning of my house in February, but one was saved and yielded *Telamonides* female on the 10th of April, 1871.

We have a third well-marked variety very nearly the same as that figured by Abbot, and for convenience I designate this as "*Ajax* var. *Walshii*." It is the earliest of the species in the spring. On the 10th of April last I confined three females of this variety, and from them obtained 125 eggs, which in due time gave me 70 chrysalids. From these emerged, between the 1st and 6th of June, 22 male and 34 female *Marcellus*, 1 male *Walshii* and 1 male *Telamonides*. On the 23rd of June, another female *Marcellus* emerged, and still another on the 12th of July. The rest of the chrysalids are alive at this date.

On the 4th day of June last, I took two female *Interrogationis* fluttering about my hop vine, and enclosed them in a keg which was covered with a cloth and placed over a portion of the vine. They immediately began to lay eggs, and from them I obtained 38 larvæ, which, as they hatched, I transferred to a breeding case in the house. From these larvæ I had 18 chrysalids. Between the 3rd and 9th of July emerged therefrom 5 males and 6 females of *Interrogationis* (black-winged), 1 male and 5 females *Fabricii* (red-winged), and one died. The larvæ exhibited every distinct type of coloration that I have hitherto noticed in these forms, and either type of larvæ produced either sex or form of butterfly indifferently.

In part ix. of the "Butterflies of N. A." (to appear in October), 3 plates will be appropriated to the three varieties of *Ajax*, and 2 to *Interrogationis* and its variety *Fabricii*, with detailed statements of my experiments and observations.—July 13, 1871.

ENTOMOLOGICAL PICNIC.

THE members of the London Branch of the Entomological Society of Ontario held their annual picnic at Maple Grove Fruit Farm, the property of Mr. W. Saunders, on Wednesday, July 26th. They assembled at 1 p.m., and were conveyed in vehicles to the place of rendezvous. The day was fine, and although the bright sunlight brought heat in its train, it was so tempered by a refreshing breeze as to make the ride quite enjoyable.

On arrival at the grounds the party, which numbered about 40, soon distributed themselves among the small fruits. The raspberries being in season attracted the most attention. The *Philadelphias* were still heavily laden with well-ripened berries, and the *Doolittle* and *Mammoth Cluster* black caps, although past their prime, added to the enjoyments of the occasion. The assembled representatives of Entomological science were expected to do double duty, and while freely partaking of Nature's bountiful and refreshing gifts to take note of such insect enemies as affected the raspberry both in fruit and foliage. The programme in this respect was found impracticable, and it was unanimously decided by the parties concerned that to do one thing at a time and do it well was the most sensible way of proceeding; so the few insects abroad were allowed to retain peaceable possession until the gastronomic requirements of the company were met. Among the red raspberries, the black caps and the well-ripened gooseberries of which there was an abundance the various groups into which the party was divided feasted until small fruits ceased to be attractive, when a line of march was formed to the picnic ground, at the back of the farm, where numerous baskets containing hidden treasures had already been conveyed.

The route lay through the plum and pear orchards the former containing 500, the latter over 1700 trees, most of which are now three years planted. We observed that some of the dwarf pear trees were already fruiting. The vinery, containing over 1000 vines, two or three hundred of which were in bearing, next claimed attention: the Concords were especially admired for their vigorous appearance and large, well-filled clusters of grapes. The trees in the cherry orchard, numbering over 300, were now in order; and these, although young, appeared remarkably thrifty and healthy, and promise well for fruit another season. Behind and at one side of the last mentioned is an

extensive apple plantation of nearly 2000 trees, a large proportion of which are now two years planted and growing well. A few of the more zealous members had their nets, pill boxes, &c., with them, but there were not many insects astir, and the trees and vines were remarkably free from caterpillars, so that but few captures were made in the orchards.

On the grassy sward, under the shade of a handsome group of maples, the company finally rested; and here, on the extended table-cloths was soon spread a tempting display of the choicest viands, furnished by the various members of the party, and supplemented by a profusion of raspberries and cream, the product of the farm, all tastefully arranged. After feasting well on these "good things," the members set off in skirmishing order and scoured the adjoining woods and fields in search of insect game, and some good captures were made. There were a few dragonflies and butterflies on the wing, which were energetically chased with but limited success; but small moths were more common and easily caught. The Coleopterists did better, and numberless logs were turned over and many a decaying stump barked to disclose the hiding places of the interesting objects of their search. A list of the captures will be found appended.

After a hunt of an hour or two, the company re-assembled and enjoyed the cool shade and the cooler ice-cream, and spent awhile in comparing captures and in social converse. On motion, all the collectors willingly handed over the results of the afternoon's hunt to the Secretary to be deposited in the Society's cabinet. By and by the setting sun gave warning of the approaching shades of night, and after votes of thanks to their courteous host, who had so kindly placed his grounds at the disposal of the Society, and to the ladies and others who had so materially aided in making the gathering such a pleasant one, the members left for their homes, all agreeing that the occasion had been one of the most agreeable reunions ever held under the auspices of the Society.

Among the captures of Lepidoptera, we observed the following species:—Polyommatus Americana; Drasteria erechthea; Heterophleps triguttata; Ebulea tertialis; Lithocolletis multipunctella; and a number of other "Micros" unknown to us, that would, no doubt, have charmed our friend, Mr. Chambers. Of the Coleoptera, the following may be mentioned:—Chlænius lithophilus and pensylvanicus; Platynus longicor-

nis and cupripennis; Pterostichus stygicus; Hydrophilus glaber; Staphylinus violaceus; Brontes dubius; Osmoderma scabra; Lachnosterna fusca; Penthe obliquata; Nyctobates pensylvanica; Dendroides Canadensis; Melandrya striata; Centronopus calcaratus; Dacne heros; besides a number of minute species that we have not yet had time to determine.

EXTRACT FROM MR. BENTHAM'S ANNIVERSARY ADDRESS TO THE LINNEAN SOCIETY.

WE have ventured to reprint the following extract from Mr. Bentham's address, feeling sure that it will be read with great interest by all students of Entomology in this country.—ED. C. E.

There is no country, however, in which the native Flora and Fauna has been so long and so steadily the subject of close investigation as our own, nor where it continues to be worked out in detail by so numerous a staff of observers; . . . but the Entomological Fauna of our country, especially in relation to the insects of the adjoining Continent, notwithstanding the numerous able naturalists who devote themselves to its study, appears to be somewhat in arrear.

In answer to my query as to works where our Insects are compared with those of other countries, I have received from our Secretary, Mr. Stainton, the following reply:— "The questions you have put to me with reference to our Entomological literature are very important; they, however, painfully call my attention to the necessarily unsatisfactory nature of my replies. Wollaston's 'Coleoptera Hesperidum' is the only separate work to which I can direct your attention as giving the fauna of a particular district, with the geographical range of such of the species as are likewise found elsewhere. R. M'Lachlan, who in 1865 had published (Trans. Ent. Soc., ser. 3, v.) a Monograph of the British Caddis-flies, gave, in 1868 (Trans. Ent. Soc. for 1868), a Monograph of the British Neuroptera Planipenna, but little is there said of the European range of our species. In 1867 (Entom. Monthly Mag., iii.) Mr. M'Lachlan, who is one of our most philosophical writers, gave a Monograph of the British Psocidæ, and he there says, with reference even to their distribution in our own country, 'As a rule, I have not mentioned special localities; these insects have been so little collected that an enumeration here of known or recorded localities would probably appear ridiculous

in a few years.' The Rev. T. A. Marshall has given (Entom. Monthly Mag., i. to iii.) an essay towards a knowledge of the British Homoptera, in which occasionally allusion is made to the European distribution of our British species.

"The position of the Insect-fauna of Britain may be thus stated: the late J. F. Stephens commenced in 1827 a systematic descriptive work of all the orders of British Insects as 'Illustrations of British Entomology:' it ceased to appear after 1835, until a supplementary volume came out in 1846. The Lepidoptera, Coleoptera, Orthoptera, Neuroptera were wholly, the Hymenoptera partly, done, the Hemiptera and Diptera altogether left out. In 1839, Mr. Stephens published, in a more compendious form, a 'Manual of British Beetles.' In 1849, an attempt was made to supply the gaps in the British Entomology left by Stephens, and a scheme of a series of volumes called 'Insecta Britannica' was elaborated, in which Mr. F. Walker was to undertake the Diptera, Mr. W. S. Dallas the Hemiptera, and great progress having been made in our knowledge of the smaller moths since 1835, I undertook to write a volume on the Tineina. This scheme was so far carried out, that three volumes on the British Diptera by Mr. F. Walker (assisted by the late A. H. Haliday) appeared in 1851, 1852 and 1856, and my volume on the British Tineina in 1854. In 1859, another great group of the smaller moths was described by S. J. Wilkinson in a volume entitled 'The British Tortrices.' The British Hemiptera, not having been done by Mr. Dallas, were undertaken by Messrs. Douglas and Scott for the Ray Society; and in 1865 a 4to volume was issued, containing the Hemiptera, Heteroptera, leaving the Homoptera for a second volume, still in progress. Even in this elaborate work little or nothing is said of the geographical distribution out of Britain of our British species. The same will apply to the late J. F. Dawson's 'Geodephaga Britannica,' published in 1854; to Westwood's 'Butterflies of Great Britain,' published in 1855; and to E. Newman's 'Illustrated Natural History of British Moths,' published in 1869.

"I believe I do not at all exaggerate if I say that for many years Entomology was pursued in this country with an insularity and a narrow-mindedness of which a botanist can scarcely form a conception. The system of only collecting British Insects was pursued to such an extent, that it was almost a crime to have a non-British insect in one's possession; if accidentally placed in one's cabinet it might depreciate the value of the entire collection, for Mr. Samuel Stevens can assure you that the value of the specimens depends very much upon their being indubitably

and unmistakeably British. A specimen caught in Kent which would fetch *2l.* would not be worth *2s.* if caught in Normandy. I satirised this practice several years since in the 'Entomologist's' Weekly Intelligence' (vol. v. and 1858, articles 'Jeddo' and 'Insularity'), but it is yet far from extinct."

Perfectly concurring in Mr. Stainton's observations in the last paragraph, I would, however, add, that there are purposes for which a local or geological collection distinct from the general one may be of great use, and such a collection would be much impaired by the introduction of stray foreign specimens. In a local museum, a separate room devoted exclusively to the productions of the locality is very instructive with reference to the history of that locality, and I have seen several such spoiled by the admission of exotic specimens, giving the visitor false impressions, which it takes time to remove. But it is never from such an exclusive collection that the fauna or flora of the district can be satisfactorily worked out, or that any branch of Zoology or Botany can be successfully taught.

Mr. Stainton adds: "It has been suggested to me that those who have critically studied the distinctions between closely allied species have rarely the time to work out in addition their geographical range, and that those who might work up the latter subject might fail in their good intentions for want of a proper knowledge of species." Upon this I would observe that, in the due appreciation of a species of its limits and connections, its geographical range and the various forms it assumes in different parts of its area are an essential element; and it appears to me that the neglect of this and other general characters is one reason why many able naturalists, who have devoted their lives to the critical distinction of races of the lowest grades unduly raised to the rank of species, have really contributed so little to any science but that of sorting and naming collections. On the other hand, the study of geographical range without a proper knowledge of species is little more than pure speculation. Division of labour carried too far tends to narrow the mind, and rather to delay than advance the healthy progress of science.

Mr. Stainton informs me that "there has just appeared a monograph of the Ephemeridæ, by the Rev. A. E. Eaton (Trans. Entom. Soc., 1871), treating of those insects throughout the globe; and when any species are noticed which occur in this country, their entire geographical range is noticed. It is altogether a valuable paper, on account of the thoroughness with which it seems to be done."—*Nature*, July 6, 1871.

NOTES ON THE EGG AND YOUNG LARVA OF ALARIA FLORIDA.

BY W. SAUNDERS, LONDON, ONT.

On the 4th of July I found a number of eggs of this beautiful moth on the evening primrose, *Œnothera Lamarckiana*. They were found attached to the stalks of the young flower buds; to the sides of the calyx of the flower, and also to the young leaves at their base. The eggs were quite firmly fastened among the long stout hairs with which the cuticle of the calyx and flower stalk is covered.

Description of egg examined under a magnifying power of 45 diameters:- Length, 1-40th of an inch; width, 1-45th. Form nearly round, flattened a little at the base, where it is also somewhat contracted in size, and slightly conical above, with numerous raised striæ, about 36 in all, which run into each other before they reach the tip, where they are reduced to less than half the number, and terminate at the base of a small ring which crowns the tip: this ring has a depression in the centre, and the space around the cavity is finely punctured. The striæ are irregularly crossed by numerous fine, raised lines, and thus the whole surface is minutely reticulated, but the meshes are irregular in form, with a slight depression in the centre of each. The color of the egg is dull yellowish pink.

Some of the eggs hatched on the 7th of July, when the following description of the young larva was taken:-

Length, about 1-15th of an inch, cylindrical. Head large, and black, with a few black and brown hairs. Body above of a dull shining yellow, with a wide dorsal band of dull white. On each segment there are from 8 to 12 shining black dots, from each of which arises a single black or brown hair. The upper portions of second and terminal segments have each a large patch of black.

Under surface similar to the upper, but with fewer dots; feet black; prolegs pale greenish, faintly tipped with brown.

The changes in appearance of the larva at its subsequent moultings were not noted. A description of the full-grown caterpillar has already been given in the ENTOMOLOGIST (see p. 6, vol. 2).

BOOKS RECEIVED.

Record of American Entomology for the Year 1870. Edited by A. S. Packard, Jr., M.D. Naturalists' Book Agency: Salem, 1871. (8vo. pp. 27. 50 cents.)

We have recently received a copy of the "Record" for 1870. It is, we regret to observe, less than half the size of the preceding issue; but, as the Editor observes, "we are not to infer that Entomology is on the decline in America; for there are many indications beneath the surface that promise much for the future of this study." There are references in this part to the notes or articles of thirty-five Entomologists, including six Canadians and five others who have contributed to the pages of the Canadian Entomologist, and to the descriptions of three hundred and one new species of North (and Central) American Insects that have been published during the past year. We regret exceedingly to learn from Dr. Packard that this useful publication is not being supported by American Entomologists in any degree as it ought to be, and that, unless an improvement takes place, it must be discontinued. Up to July 22 only *three* subscriptions had been received for the "Record" of 1870! This surely is a sad disgrace to the students of this branch of Natural History; but we trust that the mere mention of it will be sufficient to cause them to send in their subscriptions at once to the Naturalists' Book Agency at Salem, and relieve the hard-working Editor of further pecuniary responsibility. The price of the present issue is only fifty cents, while a complete set of the issues for 1868, 1869 and 1870 will be furnished for the small sum of a dollar and a half.

Third Annual Report on the Noxious, Beneficial, and other Insects of the State of Missouri. By Charles V. Riley, State Entomologist. Jefferson City: H. Willcox. 1871. (8vo. pp. 183.)

The first sixty pages of this valuable Report are occupied by an elaborate and most useful account of the species of *Curculionidæ* that are very injurious to fruits and vegetables, together with notices of their parasites and the best means of combatting their ravages. Then follow descriptions of eleven different insects that are injurious to the grape-vine; and notices of the Colorado Potato Beetle, the Apple Codling Moth, the Corn-worm, the Fall Army-worm, the Apple-tree and the Forest Tent Caterpillars, the Fall Web-worm, the Blue-spangled Peach-worm, and the Ash-gray Pinion; a description of the Glassy-winged Soldier-bug, a new friend to the grape-

grower; an account of the White-lined Morning Sphinx; and an interesting article on the Archippus Butterfly and its mimic, the Disippus. We give a full list of the contents of this volume in order to show our readers how replete it is with valuable and interesting matter, whether regarded in a scientific or economic point of view, and whether referred to for information on the common pests of our gardens, or as a contribution to the Darwinian controversies of the day. The whole volume, we must not omit to add, is handsomely illustrated with over seventy of Mr. Riley's admirable drawings. The following new species of insects are described and figured in the course of the volume:—Coleoptera, *Analcis fragariæ*, *Bruchus fabæ*; Lepidoptera, *Amphipyra conspersa*, *Xylina cinerea*; Diptera, *Tachina archippivora*; Hymenoptera, *Porizon conotrachela*, *Microgaster limenitidos*.

First Annual Report of the Geological Survey of Indiana, 1869. By E. T. Cox, State Geologist.

We are much indebted to Dr. G. M. Levette for these two handsome volumes.

Embryological Studies on Diplax, Perithemis, and the Thysanurous Genus Isotoma. By A. S. Packard, jun. Salem: 1871. Being the Second Memoir of the Peabody Academy of Science.

A valuable contribution to Embryology, very handsomely printed and illustrated by three excellent plates, besides several woodcuts.

Second and Third Annual Reports of the Trustees of the Peabody Academy of Science for the Years 1869 and 1870. Salem: 1871.

The Butterflies of North America: with Colored Drawings and Descriptions. By Wm. H. Edwards. Philadelphia: The American Entomological Society, Jan., 1871.

This magnificent work has now reached its seventh part, and shows no signs of falling off either in the beauty or excellence of its plates or the value of its letterpress. All Entomologists who can possibly afford it, ought to be subscribers; they will find the reception of each new number a source of intense delight, somewhat similar to that experienced upon the capture of a new or rare species. The eighth part, Mr. Edwards informs us, will be ready in a few days; the last plate is now in the hands of the colourist.

On Asymetry in the Appendages of Hexapod Insects. By S. H. Scudder and Edw. Burgess. Boston: 1870.

This essay treats especially of the Lepidopterous genus Nisoniades, and is illustrated by a large plate.

Catalogue of Coleoptera and Lepidoptera. By Geo. Dimmock. Springfield, Mass.: April, 1871.

Catalogue of Canadian Birds, Insects and Squirrels, collected in the vicinity of Toronto, by Dr. A. N. Ross. 1870.

Proceedings and Transactions of the Nova Scotian Institute of Natural Science. Vol. ii., part 4, May, 1870.

Contains many interesting articles, and a complete index to previous volumes.

MISCELLANEOUS NOTES.

Lepidoptera from Florida.—We have received a small collection of Lepidoptera from Mr. Joseph E. Chase, Holyoke, Mass., that were taken in the State of Florida; it has afforded us pleasure to identify them for him. No. 1, *Enyo lugubris*, Drury; the larva is said by Dr. Clemens to feed upon the common Virginian Creeper; we may hope, therefore, to find this Sphinx in Canada, as its food-plant is very abundant. No. 2, *Agraulis vanillæ* Linn.—two specimens. No. 3, *Terias lisa* Boisd. has occasionally been taken in Canada. No. 4, *Junonia cænia* Hubn. also occasionally found in this country. No. 5, *Pieris monusta* Godt. (*P. cleomenes* Boisd. and Lec.); a male and female, the latter distinguished by the smoky colour of its under surface. No. 6, *Callidryas eubule* Linn.—a pair; the male may be distinguished from the female by the lovely immaculate yellow colour of its upper surface. No. 7, *Papilio thoas* Linn. taken occasionally in Canada. No. 8, *Charocampa tersa* Linn. No. 9, *Melitæa* —— ?—a species quite new to us, and probably undescribed.

Personal.—We very much regret to learn, from the communication of our esteemed correspondent, W. H. Edwards, Coalburgh, West Virginia, contained in the present number, that his dwelling has recently been consumed by fire, and with it some portion of his Entomological material. We sincerely hope that he succeeded in saving his valuable collection of Lepidoptera.—Ed. C. E.

REMITTANCES RECEIVED SINCE ISSUE OF No. 2, VOL. III.

Mus. Com. Zoo., Cambridge, Mass., $8 ; Dr. S. V. S., St. Louis, Mo., $1 ; M. M. Kirkwood, Mo., $1 ; Quebec Branch, $10 ; J. G. B., Quebec, $2.76 ; H. L. M., Malden, Mass., $1 ; T. S., New Aberdeen, Ont., $1 ; W. C., Hespeler, $1 ; A. L., Hamilton, $1 ; Mechanics' Institute, Hamilton, $1 ; Rev. R. B., Hamilton, $2 ; A. M., Hamilton, $1 ; J. F., Hamilton, $1 ; W. H. M., Hamilton, $1 ; O. T. P., St. Catharines, $1 ; J. K., Galt, $1.75 ; C. H., Waterville, Me., $1 ; Soc. Nat. Hist., Boston, $10.38 ; A. L. G., Beachville, $1 ; J. G. F., New Albany, Ind., $1 ; J. A., Brooklyn, N.Y., $1 ; Dr. F. B. K., Reading, Mass., $1 ; Dr. S. A. S., Reading, Mass., $1 ; J. B., San Francisco, $2.13 ; A. J. C., $1 ; S. W., Cooksville, $1 ; J. H., West Farms, N.Y., $1 ; J. M. J., Halifax, $5 ; Rev. E. A. D., Baltimore, Md., $1 ; H. K. M., Boston, Mass., $1 ; A. M., England, $1.

EXCHANGES, &c.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

CORK AND PINS.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

CANADIAN ENTOMOLOGIST, Vols. 1 and 2. We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. III. LONDON, ONT., SEPTEMBER, 1871. No. 5.

ENTOMOLOGICAL NOTES DURING A TRIP TO LAKES HURON AND SUPERIOR.

BY THE EDITOR.

It was recently my good fortune to spend a very pleasant fortnight—from August 10 to August 24 - on Lakes Huron and Superior, chiefly with a view to obtain a thorough rest from work of every description, and to enjoy the pure bracing air and splendid scenery of these inland seas. The greater portion of the time was spent on the steamboats *Algoma* and *Chicora*, and as most of the stoppages at the various ports were made at night, I had few opportunities for collecting insects. I remained over, however, for five days on the Canadian side at Sault Ste. Marie, and devoted as much of the time as I possibly could to the investigation of the insects of the neighborhood. During the summer of 1870, I also paid a short visit to the Sault, and passed a few days there and at Garden River, and Bruce Mines. On that occasion, as I accompanied the Bishop of Toronto on his Confirmation tour among the Indians, I had no opportunity to do more than pick up a few specimens here and there; these I shall mention, with the captives of this year, under their different localities. So few Entomological investigations have been made in that far-stretching north-western region, that I do not hesitate to occupy a portion of our space with an account of the little I have been able to do myself, and trust that it may be of interest to the reader.

LEPIDOPTERA RHOPALOCERA.

Pieris oleracea Boisd. (*P. casta*, Kirby).—Very common at Collingwood both last year and this: a few observed at Bruce Mines; not uncommon at Sault Ste. Marie. Taken on the north shore of Lake Superior by Agassiz's Expedition in 1848.

Colias philodice Godt. Plentiful at Collingwood, Bruce Mines, and St. Joseph's Island; excessively abundant at the Sault.

Colias curytheme Boisd.—A single specimen observed at Bruce Mines; not uncommon at Sault Ste. Marie. This handsome orange butterfly was quite a prize to me, as I had never before seen it alive, and rarely in cabinets. Its habits appeared to be similar to those of *C. philodice*, but its flight was much more rapid; it hardly ever rested for more than an instant at a time, and could not be captured without a long and exciting chase. I was enabled, however, to obtain about a dozen specimens, with the assistance of some young friends at the Sault, who became speedily infected with my entomological ardor, and before I left, commenced to form collections for themselves. If they keep up the pursuit, they will no doubt be able to afford us, by and by, much valuable information respecting the insect fauna of the locality. Among the dozen specimens of *C. curytheme*, I only found one female; probably as the specimens were all fresh and in good order, the females do not appear till a few days later than the males.

Colias Keewaydin Edwards.—One male specimen taken at the Sault. I have little doubt that this is merely a variety of the preceding species. For description and admirable figures of both, see Edwards' *Butterflies of North America*, Part IV.

Danais archippus Cramer.—But very few specimens seen at the Sault: a single one flew across the steamer when on Georgian Bay, fifteen or twenty miles from the nearest land. Taken on the north shore of Lake Superior by Agassiz's Expedition.

Argynnis cybele Fabr.—A single specimen taken at Sault Ste. Marie.

Argynnis aphrodite Fabr.—Sault Ste. Marie; abundant. North shore of L. Superior (Agassiz).

Argynnis myrina Cramer.—Sault Ste. Marie; very abundant. North Shore of L. Superior (Agassiz).

Grapta interrogationis Fabr.—Sault Ste. Marie; a single specimen.

Grapta progne Cramer.—Sault Ste. Marie; rare.

Vanessa antiopa Linn.—St. Joseph's Island and Sault Ste. Marie; not at all common, compared with its usual abundance in the Southern parts of Ontario.

Vanessa Milberti Godt.—Sault Ste. Marie; rare.

Vanessa J-album Boisd. and Lec.—Bruce Mines, St. Joseph's Island, and Sault Ste. Marie; very abundant. North shore of Lake Superior (Agassiz).

Pyrameis huntera Drury.—Sault Ste. Marie; rare.

Pyrameis cardui Linn.—Larva found feeding on thistle at the Sault, but no specimen of the imago seen.

Polyommatus Americana Harris.—Sault Ste. Marie; very abundant.

Hesperia ———?—A species quite new to me, with very distinct white spots on the under side. I have not yet had time to look up authorities for its determination. It appeared to be quite common on St. Joseph's Island and at Sault Ste. Marie.

The foregoing list includes all the species of butterflies that I observed. The only others found by the Agassiz Expedition on the northern shores of Lake Superior were *Colias pelidne?* Boisd.; *Colias chrysotheme?* Esper. (probably the species that I met with): *C. Eurytheme* Boisd.); *Limenitis arthemis* Drury.; and *Melitæa cocyta* Cramer.*

LEPIDOPTERA HETEROCERA.

Deilephila chamænerii Harris.—A single specimen hovering about Petunias and other flowers in a garden at Sault Ste. Marie. North shore of Lake Superior (Agassiz).

Eudryas grata Fabr.—One specimen: Garden River.

Lycomorpha pholus Drury.—Several specimens on lichen-covered rocks at Bruce Mines.

Hypoprepia fucosa Hubn. (*Gnophria rittata* Harris). Bruce Mines and Sault Ste. Marie; several specimens.

Utethisa bella Linn.—Bruce Mines; one specimen.

Arctia Saundersii Grote.—Garden River; two specimens.

Samia cecropia Linn.—A large number of the larvæ of this moth were observed last summer on a young plum tree at Collingwood.

Acronycta acericola Guen.—Larva found feeding on Cornel at Sault Ste. Marie.

Nephelodes minians Guen.—Attracted by light, Sault Ste. Marie.

Agrotis jaculifera Guen. Garden River.

Graphiphora baja Gmel.—Sault Ste. Marie.

Erastria carneola Guen.—Sault Ste. Marie.

Plusia balluca Geyer.—Sault Ste. Marie.

Plusia simplex Guen.—Sault Ste. Marie.

Plusia ——? Two specimens of a species quite new to me, and which I have not yet determined; Sault Ste. Marie.

* Agassiz's Lake Superior, page 392.

Catocala concumbens Walk.—Two specimens, apparently a variety of this species; Sault Ste. Marie. They were captured flying in the day time.

A few more moths, chiefly small species, were taken at various points, but have not yet been determined, from want of leisure.

I may mention that I saw at Collingwood, in a lady's drawing-room, a specimen of the gigantic moth *Erebus odora* Linn., that had been captured a few years ago in the neighborhood. This makes the third specimen that, so far as we know, has been taken in Canada.

I shall endeavour to give a list of the Coleoptera and other insects taken, in a future number of this journal.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

[Continued from page 58.]

LITHOCOLLETIS.

7.—L. virginiella. N. sp.

Silvery white; apical half of the anterior wings pale golden; there is a long, pale golden basal streak situated *just within the costal margin, and strongly dark margined towards the dorsal margin, and extending to the pale golden of the apical portion of the wing.* In the pale golden portion are four silvery costal and two silvery dorsal streaks, all dark margined internally; the first dorsal and first costal streaks opposite, and both very oblique, and almost confluent in the middle of the wing; second dorsal opposite the second costal. Apical spot black: hinder marginal line, at the base of the ciliæ, dark brown; ciliæ silvery. *Alar. ex.* $\frac{1}{3}$ *in.*

The larva is cylindrical, small, first segment (after the head) largest, and tapering thinner to the anal segment. Very pale greenish, with a transverse dark brown macula on top of each segment. It is another instance of a larva of the first group mining the upper surface of the leaf. It mines the leaves of the Ironwood or Hornbeam (*Ostrya virginica*). The mine is a very white blotch, flat at first, but finally the leaf is completely folded upwards.

There are five species of *Lithocolletis* mining the leaves of *O. Virginica*, two of which have been described by Dr. Clemens, and two others in my collection are yet to be described. This species is smaller than any of those mentioned in my former communication, and differs from them in the larval state; the differences from them in the imago are indicated by the italics.

Kentucky not abundant.

Since my former communication I have had *L. Clemensella* (*Ante*, p. 57), from mines on the under side of the leaves of the sugar maple (*A. saccharinum*), identical with those of *L. lucidicostella* Clem., and which I supposed were the mines of that species; but *I think* that the pupa of *L. Clemensella* inhabits an ovoid cocoon of frass. As the exclusion of a larva from its mine for the purpose of describing it, necessitates the death of the larva, and there are thus two species in mines exactly alike, it follows that Dr. Clemens may have described the larva of *L. Clemensella* as that of *L. lucidicostella*.

Since then I have also taken *L. caryæ-albella* in Wisconsin. No doubt the other species mentioned also occur there, as their food plants all thrive as far north as Green Bay.

ERRATUM.- For *L. tiliacella ante*, p. 56, read *L. tiliæella*.

SECTION B.

Div. 1.- Anterior wings golden, saffron, orange-reddish or brownish-yellow.

Sub-div. a, with an apical spot.

*With a basal streak.

†*Without fasciæ, but with dorsal and costal streaks.*

8.—*L. Ostryæfoliella* Clem., loc. cit. *supra*.

9.—*L. Obscuricostella* " " "

I have found both of these species in Kentucky, though the former is rather rare. Both mine the leaves of the Ironwood (*Ostrya Virginica*). *L. Obscuricostella* has the basal streak dark margined. *L. Ostryæfoliella* has it unmargined; and there are other differences between them. Both are small; *Al. ex.* less than ¼ inch. Larvæ of first (cylindrical) group mines on the under surface.

10.—*L. robiniella* Clem., *loc. cit.*

Argyromiges pseudacaciella Fitch., *5th Rep., Sec. 335.*

Argyromiges Morrisella ? " " " *336.*

Argyromiges Uhlerella ? " " " *337.*

An examination of a large series of specimens shows, I think, that *A. Morrisella*, *A. Uhlerella*, and *A. pseudacaciella*, are merely variations or worn specimens of the same insect, which, having been previously described by Dr. Clemens in an English publication (The Entomologist), should be called *L. robiniella*. There is some variation in the ornamentation of the species. In some the apical spot is circular; in others it is a short streak rather than a spot; there is a difference in the intensity and extent of the brown coloring of the dorsal margin of the wings, and sometimes the first dorsal streak (or rather that described as such by Dr. Clemens), is divided by a black streak on the dorsal margin so as to make it almost V-shaped. In all, the basal portion of the dorsal margin is black, and in this black portion (near the basal ¼) is a paler (or cinereous) dorsal spot or streak, which is between the first dorsal streak of Clemens' and the base. Dr. Clemens placed this species in the section having "no basal streak." But the black dorso-basal portion above mentioned is bordered on the fold by a paler, rather cinereous, median basal streak, which curves towards the dorsal margin, and unites with the cinereous dorsal spot. Sometimes, and in some lights, both this streak and spot are indistinct or invisible, but in others they are distinct, and sometimes the streak is, at the base, distinctly white. *Al. ex.* ¼ inch. Common. Wisconsin. Kentucky.

The larva is cylindrical, and mines the leaves of the Locust (*Robinia pseudacacia*). Dr. Clemens records it as mining the under side only, but I find it about as frequently mining the upper as the under side, and have frequently bred it from both mines. This is another instance of a cylindrical larva mining the upper surface. In the multitude of larvæ from the under surface that I have examined, I have found no variation in larvæ of the same age, and none are marked with maculæ; whilst usually, though not always, the larva from the upper surface has a distinct dark brown macula on top of each segment. The mine upon the upper surface is also rather smaller, and is usually on the midrib, and

the leaf is more folded. But I have not been able to detect any difference between the Imagines.

Dr. Clemens also records it as mining the leaves of *Amphicarpæa monoica*, or Hog pea-nut; but my botanical friends tell me that *A. monoica* is not found in this locality, and I have not met with it.

LOCUST LEAF MINERS.

What is *Anacampsis robiniella* Fitch. *5th Rep., Sec. 334.?*

Dr. Fitch says that the mine is white blister-like, and on the underside of the leaves of the locust. I quite concur with Dr. Clemens that this is the mine of *L. robiniella, supra*, and that there is no other similar mine upon the under side of these leaves. But there is both upon the upper and under side of the leaves a *flat, pale yellowish* mine containing the larva described by Dr. Fitch as that of his *Anacampsis robiniella*. This larva is the same which I had before me as stated, *Ante* p. 54, and which, like Dr. Clemens, I supposed to be a *Lithocolletis* larva of the second (flat) group. In fact it is identical with the larvæ of that group in structure and appearance, except that the sides of the segments are perhaps a little more mammilated; and thus Dr. Clemens was in error in supposing that the flat larvæ were confined to the upper surface, for this mines both surfaces indifferently. It is pale green, with a line of dark green contents. The mine always remains flat, and the larva usually leaves it, and enters the pupa state on the ground in a cocoon, described by Dr. Fitch as being "a small, broad, oval cocoon, 0-18th in. long, and 0-12th in. thick," woven, however, of pale yellow instead of white silk, as stated by Dr. Fitch; sometimes, however, it pupates in the mine. The larva is of about the same length as the cocoon. Yet Dr. Fitch describes the Imago as having an expanse of 0-45 in.! Since the remarks at p. 54 *ante* were written, I have bred the imago from these cocoons, and instead of *Anacampsis robiniella*, I obtained an undescribed *Leucanthiza*, to be hereafter described as *L. ornatella*, and which for the richness and brilliancy of its tints is not surpassed by any insect known to me. It could not by any possibility be mistaken for *Anacampsis robiniella*. Dr. Packard (*Guide p. 349*), describes *Depressaria robiniella*, which can not possibly be the *Anacampsis*, and I propose hereafter to describe as *Depressaria pseudacaciella*, still another species, the *young* larva of which lives as a guest, or rather as an intruder, in the mines of *L. robiniella*, *Leucanthiza ornatella*, and *Parectopa robiniella*. (I have seen it cut its

way into the mines). But by no possibility could this species be mistaken for the *Anacampsis*, nor could *Parectopa robiniella*. It is therefore pretty evident that Dr. Fitch's *Anacampsis is composed of the mine of Lithocolletis robiniella, the larva of Leucanthiza ornatella, and of an unknown imago.* It cannot be supposed that Dr. Fitch mistook a *Lithocolletis* or a *Leucanthiza*, or any other insect included in *Argyromiges* Curtis, for an *Anacampsis*, which includes *Gelechia* and kindred genera. Dr. F. describes *Anacampsis robiniella*, and on the next page, *Argyromiges pseudacaciella*, and was therefore fully aware of the difference between the genera; and his *A. robiniella* is no doubt a *Gelechia* or closely allied thereto.

On two or three occasions I found in the mines of *Lithocolletis robiniella*, and in company with it, a much larger larva, of which I kept no description, and which I did not succeed in raising to the imago. It lived *in the mine* in a tubular passage or channel formed of frass, and may prove to be the larva of the lost *Anacampsis*. I know no other miners of the Locust.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from Page 32.)

[73.] 107. COLYMBETES TRISERIATUS, *Kirby*.- Length of body 7¾ lines. A single specimen taken. I have a specimen also from New England, taken by Professor Peck.

Body elliptical, rather depressed, underneath black, and covered with an infinity of branching or confluent wrinkles, as if scratched by a pin or needle. Head black, anteriorly testaceous, between the eyes is a pair of transverse red spots; antennæ and palpi testaceous, dusky at the tips: prothorax testaceous with an abbreviated, sub-bilobed, discoidal band: variously acuducted so as somewhat to resemble net-work: scutellum ferruginous, black at the base, very minutely and confluently punctured: elytra dusky, which colour, for they are really lurid or dirty yellow, is produced by an infinity of transverse black lines or furrows, but which at the lateral margin lose their blackness; besides these there are three rows of punctures arranged longitudinally but not regularly, the first

adjoining the suture, and the two others being discoidal; between the outer one and the margin, especially near the apex, are some scattered punctures; the epipleura, and sides of the fore-breast, are yellow: legs testaceous; thighs and tibiæ punctured.

This species is intermediate between *C. striatus* and *C. dolabratus*, with the former it agrees in the majority of its characters, particularly in the longitudinal rows of punctures, except that its sutural one is more perfect; and with the latter in the prothoracic band and the color of the legs. The transverse furrows of the elytra are rather deeper than those of the first-mentioned species, and not so deep as those of the last.

These insects, adding *C. fuscus*, may perhaps be regarded as forming a subgenus, whose common character is the peculiar sculpture of the elytra. [Synonymous with *C. sculptilis* Harris; a species taken in Canada.]

108. COLYMBETES (HYDATICUS) RUGICOLLIS, *Kirby*. — Length of body 6 lines. Taken in Nova Scotia by Dr. MacCulloch.

[74-] Body rather obovate and depressed; underneath rufous cloudy with dusky. Head subrufous, dusky behind; antennæ and palpi yellowish, dusky at the tip; prothorax with the posterior angle acuminate, subrufous, dusky in the disk, posteriorly scratched longitudinally as if by a pin: elytra pale-yellow, thickly and minutely reticulated or vermiculated with black; lateral margin yellow, unspotted; epileura yellow; prosternum depressed. This species appears to represent *C. H. irroratus*.

109. COLYMBETES (HYDATICUS) MACCULLOCHII, *Kirby*.—Length of body 5¾ lines. Several taken in Nova Scotia by Dr. MacCulloch.

Body obovate, depressed, glossy; underneath black, confluently punctured and wrinkled. Head posteriorly minutely punctured, black; nose, mouth, and its organs, and a band between the eyes pale yellow; antennæ pale with the joints above dusky at the tip: prothorax punctured, pale yellow, with a discoidal band, dilated at each extremity and surrounded by a black margin of the same colour: elytra black, sprinkled with innumerable pale-yellow dots; near to the apex is a pale, angular, undulated band, and beyond it a round white spot; the margin of the elytrum is paler than the rest: the three intermediate ventral segments of the abdomen have each a pair of roundish pale spots, one on each side; the four anterior legs are pale yellow. [Previously described as *Acilius Mediatus* Say—Ent. Works ii. 508.]

110. DYTISCUS OBLIGEBUKII, *Kirby*.—Length of body: male. 1 inch

and 4 lines; female. 1 inch and 5 lines. A pair were taken by the Esquimaux Ooligbuk in the Great Bear Lake River. [75.] As this species was taken by the useful, worthy and honest Esquimaux Ooligbuk, I trust I may be excused for giving to it his name. [Previously described as *Dytiscus confluens* by Say—for description *vide* Say's Ent. Works ii. p. 554.—He gives the State of Maine as its habitat; it was taken on the north shore of Lake Superior by Agassiz's Expedition, and is now included in the list of Canadian Coleoptera. Its range, it will be observed, is thus a very wide one.]

[76.] 111. DYTISCUS HARRISII *Kirby*.—Length of the body 1 inch and 8 lines. One specimen taken in the journey from New York to Cumberland House.

Body black, underneath banded and clouded with pale chestnut. Head smooth; nose, upperlip, and palpi, reddish-yellow; the latter with the last joint dusky; between the eyes is an obscure, roundish, red spot; prothorax smooth, except an anterior transverse series of punctures which does not reach the sides; as in the preceding species it is surrounded by a broad reddish-yellow margin: sculpture of the elytra like that of *D. Ooligbukii*, etc., but not so grossly punctured at the apex; side reddish-yellow, the yellow stripe terminating in a fork or two branches, the upper one not consisting of dots as in *D. Marginalis*, etc., but entire and toothed: a reddish-yellow arch marks the dilated posterior coxæ, and the base of the abdomen is of the same colour; arms and thighs, pale chestnut, tibiæ and tarsi of the four posterior legs black: the lobes of the metasternum are remarkably obtuse. I have named this insect after a very eminent American Entomologist, Dr. T. W. Harris, who well merits such distinction. [One of our commonest Canadian species of large water-beetles. North shore of Lake Superior (Agassiz). A specimen in my cabinet flew in at an open window attracted by light, July 1, 1864.

[77.] 112. DYTISCUS (*Leionotus*) FRANKLINII *Kirby*. Plate ii. fig. 1. —Length of body 1 inch and 4 lines. A pair taken in Lat. 65°.

Male. Body oblong-ovate, glossy as if covered with varnish; underneath black spotted and banded with pale chestnut; above dark olive, in certain lights of a beautiful olive-green. Head with a very few minute, scarcely discernible, punctures; antennæ chestnut; mandibles and palpi black; nose, upperlip, margins of the prothorax, and side of the elytra, dusky yellow: prothorax distinctly channelled, surrounded within the

margin with an irregular series of punctures, interrupted at all the angles, and in the middle anteriorly and posteriorly: elytra sculptured, as in the two preceding species, except that there are several very obsolete rows of flat granules, scarcely discernible, between the suture and the first row of punctures; and there is no yellow oblique band or gleam near the apex: legs black, with the arms and intermediate thighs dusky or dusky lurid; the lobes of the metasternum very acute, more than usually diverging; incurved a little at the apex.

Female. Head more visibly, though still very minutely, punctured; prothorax minutely punctured: elytra more coarsely punctured at the apex; legs dusky lurid, posterior tibiæ darker, tarsi black: scapulars, and parapleuræ grossly punctured: angle of the mesostethium wrinkled; posterior coxæ lightly, but not thickly, punctured: lobes of the metasternum very acute, not incurved on the apex. [Considered by LeConte to be a variety of *D. Confluens* Say.]

FAMILY GYRINIDÆ.

[78.] 113. CYCLINUS ASSIMILIS *Kirby*.—Length of body 5½ lines. Two specimens taken in lat 54° [79.] Body depressed, obovate; underneath glossy, black, slightly bronzed; upperlip minutely punctured: front wrinkled between the eyes; nose impressed on each side: prothorax anteriorly on each side with a transverse series of punctures parallel with the margin, and with a slight discoidal transverse impression; at the base obtusangular and somewhat wavy: elytra with nine very slightly impressed furrows, the interstices of which are minutely punctured; at the apex the elytra are wavy; epipleura black-bronzed: legs and anus testaceous. This species approaches very near to *Gyrinus Americanus* belonging to the same genus, of which I at first regarded it as merely a variety, but upon comparing it with with the specimen preserved in the Linnean cabinet, it appears clearly distinct. This species is smaller, bronzed above, and the interstices of the furrows are without punctures. [Regarded by LeConte as synonymous with *Dineutes (Gyrinus) Americanus* Linn. This species is common in Canada. LeConte (Pro. Acad. Nat. Sci., Philada., Dec. 1868, p. 367), says that it is "our most abundant species, usually known as *apple bug;* extends from Lake Superior to Texas, and from Maine to Kansas."]

114. GYRINUS IMPRESSICOLLIS *Kirby*.—Length of body 4 lines. Taken in Canada by Dr. Bigsby.

Body glossy, black underneath, above blue-black. Head a little bronzed; nose transversely impressed, wrinkled; frontal impressions large and deep: prothorax with a deep anterior transverse impression, reaching nearly from side to side, in the centre of which is also a deep punctiform impression, and behind it on each side two others, but wrinkled and more shallow; on each side also is a large gibbosity or boss: elytra nearly oblong, with eleven rows of shining bronzed punctures; at their apex the punctures are scattered, the margins also are bronzed; epipleura black; the tip of the elytra is very obtuse and almost truncated: legs rufous. This species is very near *G. marinus*, but it is much larger, and is sufficiently distinguished from it by the deep furrow or channel that runs quite across the prothorax, its more prominent bosses, and its impressions. In *G. marinus*, also, the punctures at the tip of the elytra are not scattered, but mark out a crescent-shaped area; and the apex itself is not so obtuse. [Referred to *G. borealis* Aubé, by White. (Brit. Museum Cat. 45), but probably incorrectly.]

[80.] 115. GYRINUS ÆNEUS *Leach.*—Length of body 2¼ lines. Taken in Canada by Dr. Bigsby. Very like the preceding species, but much smaller, the transverse impression of the nose and the frontal impressions are not so deep; that of the prothorax is not so conspicuous, and there are no lateral bosses; the elytra are much narrower at the apex, where, as in *G. Marinus*, a crescent is marked out by punctures.

116. GYRINUS VENTRALIS *Kirby.*—Length of body 2⅔ lines. Two specimens taken in Lat. 54°.

Nearly related to *G. aeneus*, but the whole prone surface of the body, the epipleura of the elytra, and the legs, are ferruginous; in which particulars it resembles *G. lineatus;* it is, however, much smaller than that species, the punctures in the rows are more conspicuous, and the elytra have no bronzed stripes. ["A beautiful species, easily known by its larger size and more brilliant iridescent surface; in one specimen the under surface is nearly black."—LeConte, *loc. cit.* p. 368. Taken in Canada by Mr. Pettit at Grimsby, Ont.; also on north shore of Lake Superior by Agassiz's Expedition. New York to L. Superior (LeConte).]

[81.] 117. GYRINUS ANALIS *Kirby.*—Length of body 3 lines. One specimen taken in Lat. 54°.

Near the preceding, but larger, punctures of the rows larger: breast bones black; mouth, sides of the forebreast, anus, and legs, rufous; the

remainder of the underside of the body, piceous: side-covers bronzed with a piceous tint. [Not *G. analis* Say.—Ent. Works ii. 520.]

118.—GYRINUS MINUTUS *Fabr.*—Length of body 2 lines. A single specimen taken in Lat. 65°.

Variety B. Body above blue black, with the sides, particularly of the prothorax and elytra, bronzed; underneath piceous, with the lobes of the metasternum, anus, and legs, rufous: epipleura rufo-piceous. In other respects it precisely resembles the European specimens. [*Vide* Le-Conte, Pro. Acad. N. S., Phila., Dec. 1868, p.p. 370 and 372.]

[FAMILY STAPHYLINIDÆ.]

[86.] 119. PÆDERUS RIPARIUS *Fabr.*—Length of body 3 lines. Several taken in Lat. 54°.

Head, breast, two last joints of abdomen, base of the tibiæ and apex of the thighs, black: prothorax, legs, and four first segments of the abdomen testaceous: elytra dark blue; antennæ dusky. [Probably an erroneous determination for *P. littorarius*, Grav.]

120. LATHROBIUM PUNCTICOLLE, *Kirby.*—Length of body 5 lines. A single specimen taken in Lat. 54°.

[87.] Body black, rather glossy, hairy except the prothorax. Head obovate, minutely and thickly punctured; mandibles, palpi, and what remains of its mutilated antennæ, dark chestnut: prothorax an oblong square with all the angles rounded; punctured, but not very thickly, with scarcely any smooth longitudinal space: elytra longer than the prothorax, thickly punctured, of a dark chestnut: legs maghogany, cubit armed with a short wide tooth or prominence on the inner side at the base, the four first joints of the hand are dilated, indicating probably that the specimen is a male. This appears to be the representative of *L. dentatum*, F, which it nearly resembles, but the elytra are considerably longer, the colour of the legs is darker, and the humerus, or anterior thigh, is proportionally smaller and has no tooth. [Taken in Canada.]

121. LATHROBIUM GRAVENHORSTII *Kirby.*—Plate ii. fig. 2.—Length of body 4½ lines. Two specimens taken in Lat. 54°.

This species a good deal resembles the preceding, but the palpi, mouth, scape of the antennæ, and legs, are testaceous, the remainder of the antennæ is darker; mandibles chestnut. Head oblong: anterior angles of the prothorax scarcely rounded; a distinct intermediate longitudinal smooth space adjoining which is a series of punctures strikingly distin-

guishing this species from *L. puncticolle*, the sides of the prothorax are covered with scattered punctures: the tip of the segments of the abdomen, ventral as well as dorsal, is testaceous. [Synonymous with *Cryptobium pallipes* Grav.—a species taken in Canada.]

122. LATHROBIUM [CRYPTOBIUM] BICOLOR *Grav.*—Length of body 4⅔ lines. Taken in Canada by Dr. Bigsby.

[88.] Body testaceous, hairy. Head oblong, wider than the prothorax, black, thickly punctured; mandibles and other oral organs dusky-rufous; antennæ nearly as long as the prothorax, of the same color but paler at the base and apex: prothorax punctured with a smooth longitudinal intermediate space: elytra thickly punctured: abdomen black, anus testaceous. Gravenhorst describes Knoch's specimen, which also came from North America, as having dark chestnut thorax, elytra and anus; in the specimen here described they are of the same color with the legs. The difference, as they agree in other respects, is probably accidental. [Common in Ontario.]

123. GYROHYPNUS ASSIMILIS *Kirby*.—Length of body 9 lines. Two specimens taken in Lat. 54°.

This species approaches very near to *G. ochraceus*, but is more slender in proportion to its length. Body black and glossy. Head rather larger than the thorax, behind the eyes are some rather large scattered punctures; antennæ and palpi rufous; neck rufo-piceous; prothorax piceous, with a triple series of punctures on each side leaving a discoidal smooth space; the dorsal ones consist of seven or eight punctures, and the intermediate ones are really a continuation of the dorsal, since by the intervention of a puncture or two both are united so as to form a figure resembling a bishop's crosier; the lateral series consists of a very few points, not easily seen; near the anterior angle the elytra are scarcely longer than the prothorax, punctured, with some of the punctures arranged in rows and others scattered; from the humeral to the inner apical angle, they are internally yellowish-red, and externally blackish: legs yellowish-red. [Previously described by Say—Ent. Works ii. 567—as *Xantholinus cephalus*. Taken in Ontario.]

ERRATA.—In the last number of the CANADIAN ENTOMOLOGIST, vol. iii., page 70, in 8th line from top, for "larva" read "chrysalis;" and in 11th line from top, for "larvæ" read "chrysalids."

ACCENTUATED LIST OF CANADIAN LEPIDOPTERA.

BY E. B. REED, LONDON, ONTARIO.

(Continued from page 151, vol. ii., CAN. ENT.)

*** For rules of pronunciation see page 122, vol. ii., CAN. ENT.

NOTE.—Page 150, vol. ii., for *Interrogātiō'nis read Interrogatiō'nis.*

JUNONIA—*Junō'nia*, named after the ancient goddess Juno, the insect having its wings adorned with eyes like the plumage of the peacock, the favorite bird of Juno.

———— COENIA—*Coe'nia*, from the Greek word *Koinos: common or kindred*, this genera being closely allied to that of *Vanessa* or *Pyrameis.*

LIMENITIS—*Limenī'tis*, a Greek word meaning *harbour-keeping*, an epithet applied to several divinities. o. c.

———— URSULA—*Ur'sula*, a virgin and martyr of the 5th century.

———— ARTHEMIS—*Ar'themis*, the Greek name for the goddess Diana. o. c.

———— DISIPPUS—*Disip'pus*, probably from the Latin *disipo: to scatter;* this insect being very common and having been for some time confounded with *Archippus*, another wide-spread species.

CHOINOBAS—*Choino'bas*, from two Greek words *kiōn*, *bainō*, signifying *snow frequenters*, so named by Boisduval on account of this genus being common to the most wintry parts of North America.

———— BALDER—*Bal'der*, probably from the German *Bald*, *Early.*

NEONYMPHA—*Neonym'pha*, a Greek word signifying *newly married.*

———— EURYTHRIS—*Eu'rythris*, probably meant for *Eu'rytis*, a patronymic of Iole, the daughter of Eurytus, King of the Eubœan town Elchalia.

———— BOISDUVALLII—*Boisduval'lii*, named after Dr. Jean Alphonse Boisduval, the celebrated French Entomologist, the possessor of the finest known collection of Lepidoptera.

EREBIA—*Ereb'ia, erebus*, the region of darkness ; from the dark colors of this genus. o. c.

——— NEPHELE—*Neph'elē*, the wife of Athamas, King of Thebes.

——— DISCOIDALIS—*discoidā'lis*, so called by Kirby from the marks on the anterior wing like the Grecian *discos*.

SATYRUS—*Sat'yrus*, a Satyr, a rustic Deity half man half goat. o. c.

——— ALOPE—*Al'opē*, daughter of Cercyon, King of Eleusis.

THECLA—*Thec'la*, Virgin and martyr. o. c.

——— AUGUSTUS, *Augus'tus*, named by Kirby after Augustus, one of the Esquimaux attendants of Sir John Franklin's Expedition.

——— FALACER—*Fal'acer*, from the Greek *Sphalax, buckthorn*, on which the larva feeds.

——— NIPHON—*Nī'phōn*, from the Greek *gnīphōn, a niggard*, the usual name for the old misers in the new attic comedies ; probably thus named by Godart on account of its extreme rarity.

——— MOPSUS—*Mop'sus*, a soothsayer and King of Argos.

——— ACADICA—*Acad'ica*—Acadia, the former name of Nova Scotia, part of the Dominion of Canada.

——— LÆTA—*Læ'ta*, from the Latin *lætus, joyful*.

POLYOMMATUS—*Polyom'matus*, from the Greek *poluommatos*, signifying *many-eyed*.

——— PORSENNA—*Porsen'na*, a King of Etruria, friendly to the Tarquins.

AMERICANA, *America'na*, peculiar to America.

——— THOE—*Tho'ē*, from the Greek *thoös : nimble, active*, signifying the quick darting flight of the perfect insect.

——— EPIXANTHE—*Epixan'thē*, from the Greek *epixanthus : yellow-brown*, alluding to the tawny color of the species.

——— LUCIA—*Lu'cia*, Lycia, a country of Asia Minor.

——— DORCAS, *Dor'cas*, derived from the Greek *derkomai : to gleam* or *flash like the eye*, in allusion to the quick, jerky flight of the insect.

MISCELLANEOUS NOTES.

PERSONAL. We beg to acknowledge with many thanks the receipt of some eggs of *Saturnia Eglanterina* Boisd., from Prof. Jas. Behrens, of San Francisco, Cal. The eggs arrived in perfect safety, and will, we trust, produce some good specimens. We shall be glad to receive from Prof. Behrens any Entomological material for our pages. ED. C. E.

IN No. 4 of the CANADIAN ENTOMOLOGIST, Mr. Couper makes some remarks in reference to the larvæ infesting acorns. Having just succeeded in breeding the imago I can throw some light on the subject. On October 11, 1870, I happened to observe that the acorns of a red oak (*Quercus rubra*) contained larvæ of some sort, and, making an examination, I found many of them containing from one to four short stout footless grubs, that I supposed were the larvæ of some species of *curculionidæ*. Others in which a hole had been made and carefully closed again, contained Lepidopterous larvæ, varying greatly in size in different specimens. Whether there were parasites, or merely took possession of the acorns after they were abandoned by the curculio larvæ, I was unable to decide. Taking home a couple of quarts of the acorns, I put about half of them in a glass-covered box with a couple of inches of earth at the bottom, and the remainder in a *dry* box with glass sides. In both cases the larvæ began directly to leave the acorns, those in the box containing earth immediately burrowing out of sight, while those in the other box continued to crawl from side to side until cold weather came on, by which time all the acorns were abandoned except those containing lepidopterous larvæ. Soon after cold weather set in, the unprotected curculio larvæ shrivelled up and died. By digging at different times in the earth in the other box, I ascertained not only that the grubs were alive, but that they remained in the larval state during the winter, spring, and first part of summer. In the latter part of July, 1871, the first pupa was obtained, and on August 20th I turned up an imago and also a larva. On the 23rd day of August the first mature imago made its appearance, since when they have continued to come out at the rate of one a day. The species is without doubt the *Balaninus nasicus* Say, of the Canadian list of Coleoptera; but Dr. Horn informs me that it cannot be referred to any of our named species. I have live specimens dark in color and somewhat mottled. I put a branch with a few acorns on it into the cage with them, and saw a couple shortly

after paired on an acorn. I am anxious to see them at work puncturing the acorns. As I set out with the sole hope of breeding the curculio, I paid but little attention to the moths, two or three of which came out but, with one exception, were dead and spoiled when found.—J. PETTIT. Grimsby, Ont.

AN INTELLIGENT SPIDER.—I was much interested lately in observing the ingenuity of a large spider which had constructed his web between a ladder and the wall of an outhouse in my yard. The web was planned on a magnificent scale, the supporting cable on the lower side requiring to be at least four feet in length. A piece of thick twine, about eighteen inches long, happened to be suspended to the wall by a tack, at a convenient height from the ground, and the spider, noticing the twine, had contrived to make it form part of the support of the web, by fastening his cable to the end of it, and then pulling it tight. The twine was drawn out almost horizontally by the ingenious spider, who certainly showed something a little beyond instinct in thus taking advantage of circumstances.—G. J. BOWLES, Quebec, P. Q.

A NEW INSECT-ENEMY OF TURNIPS AND RAPE.—You are perfectly aware that I do not possess any scientific knowledge in Entomology, but as you have so laudably set apart a portion of the *Entomologist* for recording facts connected with economic Entomology, I know that you will be pleased to receive any trustworthy testimony on behalf of such. Last evening my brother and I, while walking across a piece of newly-sown rape *(Brassica Napus)*, discovered that thousands of minute insects—so minute that my pocket lens was not sufficiently powerful to reveal the order they belonged to—were puncturing and feeding on the cotyledons, or first leaves; and so quickly did they spring off that I had to return home for some gum and a sheet of white paper, which, when well gummed and hastily turned over the plant, secured about a score specimens, and these I have to-day forwarded to you in a box, the bottom of which had also to be thickly gummed to keep the little skipping fellows in. Though they may turn out to be the commonest of all known insects, these are certainly new to me as being destructive to rape and turnips; for, although I have farmed extensively for twenty years, I never noticed them before; and I think you will agree with me that I do not always "go about with my eyes shut." I know that little pest the turnip-fly, *(Altica Nemorum)*, only too well; but these appear equally destructive and

equally nimble. Will you therefore kindly tell me their names, and what you know of their economy?—Henry Reeks, East Woodhay, May 24, 1871. [Ans.—These minute insects were so clogged with the gum introduced for the purpose of preventing their escape, that I cannot decide with certainty on their names: I believe, however, that they are a species of Poduridæ, perhaps Smynthurus fuscus. I should much like to see living specimens: they may be sent safely in a glass tube. The fact of such insects being destructive to rape and turnips is quite new to me, and is very interesting.] —*The Entomologist, July, 1871.*

Entomologists in France.—The second seige, by which Paris has suffered so much, has spared the persons of entomologists, but has utterly annihilated or greatly damaged many of their collections and libraries. Dr. Laboulbene, who resided in the rue du Bac, had a part of his house caught by the flames, and a great part of his library destroyed. M. Boulard's collection was shattered to atoms by shells, and many collections have suffered great injury from the partial explosion of the Luxembourg powder-mills; happily a tenth part only of the powder exploded: had the project of exploding the whole been successful, the collections in the Museum itself must have been destroyed. M. de Marseul's collection is uninjured. Almost all the provincial entomologists of France are in safety, and eagerly pursuing their favorite study, a solace in their troubles. At Strasbourg the fine collection of M. Gauber is safe, and likewise those of MM. Koechlin and Zuber-Hofer at Dornach, while that of M. Guenee, at Chateaudun, has entirely escaped the destruction of the town by the Prussians, who have taken both the collections and the books of M. Estienne, from the same town. —*Petites Nouvelles Entomologiques.*

REMITTANCES.

Received since issue of Vol. 3, No. 4.

J. W. B., Indianapolis, Ind., $2; E. L. G., Brooklyn, N. Y., $1; Dr. A. D. H., Chattanooga, Ten., $1. Messrs. D. Bros., Montreal, $1; L.W., Grimsby, Ont., $1; Kingston Branch, Ont., $5; R.V. R., Kingston, Ont., $1; J. Y., Brooklyn, N. Y., $2; Dr. J. H. S., Toronto, Ont., $3; Rev. N. D. Ste C., Nicolet, P. Q., $1; F. P. A., Cambridge, Mass., $1; H. F. B., Waterbury, Conn., $1; H. S. S., London, Eng., $1; Nat. Hist. Soc'y., Cincinnati, $1; V. T. C., Covington, Ky., $3; J. C., Kingston, $2.75; London Branch, Ont., $10; G. D. S., Boston, Mass., $1.

EXCHANGES, &c.

The undersigned would be pleased to open communications with any Entomologist in Canada, United States or England with a view to exchanging specimens. Address JAMES COLWELL, care of A. CHOUN, Kingston, Ont.

THE undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address EDW. L. GRAEF, 40 Court St., Brooklyn, N. Y., U. S.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

CORK AND PINS.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

CANADIAN ENTOMOLOGIST, Vols. 1 and 2.—We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

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These prices are exclusive of cost of transportation, and orders will please state whether the package is to be sent by mail or express.

AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. III. LONDON, ONT., SEPTEMBER, 1871. No. 6.

DESCRIPTIONS OF LEPIDOPTERA FROM ALABAMA.

BY AUG. R. GROTE.

I have collected the following Lepidoptera in the country about Demopolis, Ala., lying at the junction of the Tombigbee and Black Warrior Rivers. It has been my aim to make as complete a collection as possible of the insects inhabiting this district, in which my residence has been lately fixed, but the time at my disposal for the purpose has been cruelly limited by other duties. The summer heats preclude much exertion during the best part of the day. Nevertheless, a great many Butterflies may be taken on the flowers of the wild mint and iron-weed, without much trouble or exposure. Our commonest Butterfly everywhere is *Terias nicippe*. Throughout the entire summer it swarms in myriads. It seems to take the place here that *Colias philodice* fills in the Northern States. This latter I have never seen here; I have taken a specimen of *C. Eurytheme*. *Papilio thoas* is not uncommon, but its strong flight makes it difficult to capture. *P. ajax* and *P. philenor* are common; *P. asterias* and *P. turnus* are more infrequent; the specimens I have seen of the latter are large sized, the female always black (*P. glaucus*). *Junonia coenia* is very common. I have seen no species of *Argynnis*, but one *Eresia*, while *Euptoieta claudia* is frequently met with and I have reared it through all its stages. *Libythea bachmanii* is found in July and August on the banks of the rivers and about damp places on roads. *Apatura celtis* is commonly seen, *Limenitis ursula* more rarely. *Callidryas Eubule* becomes plentiful at the beginning of August; it is apparently double brooded. *Meganostonia caesonia* is infrequent. The commonest *Hesperiid* is *Syrichthus oileus*, while I have seen but a single specimen of *Heteropterus marginatus*, so common in the north. At some future time I hope to give a list of all the Butterflies I have taken. In the Sphingidæ I have only seen *Sesia diffinis*, *Darapsa myron*, *Cherocampa tersa*, *Macrosila carolina*, *M. cingulata* and *Sphinx eremitus*. The Bombycidæ seem very poor in numbers and species, while the Noctuidæ are exceedingly rich in both.

So far, I cannot separate this region, zoologically speaking, from the middle States. Everywhere I meet familiar insects, and, although I miss many Northern species and find new ones, I see that I am still collecting in the Atlantic District of the United States. For the present paper I select the following Lepidoptera from my collections:

THECLA DOLICHOS (*Attelides dolichos*, Hubner Zutraege.) Male.—The ground color of the wings above is a dead black, but this is nearly entirely overlaid with a most brilliant deep and changeable metallic blue. On the primaries, the external margin narrowly and apices are of the ground color as well as an outwardly vaguely defined ovate discal spot.—On the Secondaries, the costal region about the apices is largely and the external margin very narrowly black. There are two tails: The first, obsolete at the extremity of the 2nd m. nervule; the second, long (6 m. m.) and flexile at the end of 3rd m. nervule. Below this, to anal angle, the wing is outwardly produced, and this exserted portion is medially cleft and shows golden powdery scales on paler blue interspaceal black-margined shade spots. Internal margin clothed with long blackish hair. Beneath the wings are dead black. The fore wings show two white dots at base and a median longitudinal metallic blue shade extending over, beyond and about median-nervule; costal edge scarlet at base. Secondaries with two scarlet basal patches; internal margin shaded with pale metallic blue; an interrupted pale metallic blue shade line runs along and within the external edge interruptedly from 1st m. nervule to the anal angle; on the exserted portion of the wing this is powdered with golden scales. Inside of this, below 2nd m. nervule, is a very dark red band interrupted by the veins. Inside of this a narrow line of golden atoms, very narrowly separated by the ground color of the wing from an inner golden similarly interrupted band, widening on the last interspace. Body above, metallic changeable blue, greenish (as is the base of the primaries) in certain lights, with longer hairs at the base of the thorax. Beneath the abdomen is scarlet, the thorax and legs black with white spots. Head black with a white spot on vertex; eyes margined with white; palpi black, white at the base.—Base of the head white; the ocular marginations are interrupted, forming lines on the front and spots behind. Antennæ rather stout, gradually swelled, black. Expanse, 42 m. m.

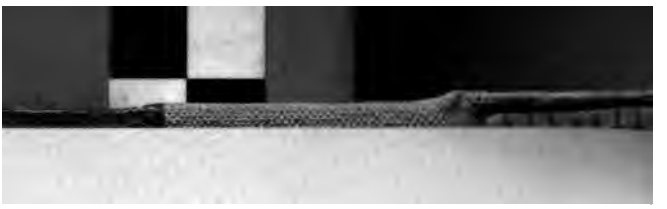
A single specimen taken on July 28th, on the outskirts of an open grassy wood. Its flight was short and heavy, but this may have been

owing to its evidently having recently left the chrysalis, its freshness showing off the incomparable beauty of the species.

ACIDALIA PERSIMILATA *Grote.* ♂ ♀. This species, which I described originally from a specimen taken in Buffalo, N. Y., I have found in Alabama. The male antennæ are finely pectinate. The wings above are of a dirty greenish grey, mottled in appearance. The outer line alone is tolerably distinct: this is whitish, waved, preceded by a dark linear shade and connecting a series of minute nervular dots. There is a row of whitish interspaceal sub-luniform dots on the terminal space tolerably evident. Fringes greyish. In shape, the primaries are triangulate, with determinate apices; secondaries reduced. There is a very fine dark terminal line on both wings which, as usual, agree in appearance. This is a frail species, readily losing its greenish tint. Exp., 19-20 m. m. In Mus. Peabody Academy of Science, Salem, Mass.

ACIDALIA PURPURISSATA *Grote.* ♂ ♀. Size, small or moderate; external margin of wings rounded, apices of primaries indeterminate. Wine color, with a purple shade. Primaries crossed by three irregular, transverse yellowish lines, darkly defined inwardly; a faint series of subterminal interspaceal maculations is visible superiorly. The outer of the three lines is slightly projected over the median nervules, curving inwardly opposite the disc. The costal region is shaded with pale yellow, and this color is continued over the collar and thorax in front. A very fine terminal black line edges both wings, interrupted by pale dots on the nervules. Fringes, rosy wine color, brighter than the wings. Secondaries crossed by two lines corresponding with the outer two of the primaries. Discal streaks on both wings analogous to the transverse lines. Beneath, paler, washed with rosy wine color, the secondaries almost wholly whitish with a roseate terminal shade. Abdomen above and thorax behind concolorous with wings, the former with yellowish dorsal marks. Antennæ simple. Hind legs with a single reduced pair of spurs. Body, pale beneath. Exp., 17-19, m. m. Types in Mus. Peabody Academy of Science, Salem, Mass. Resembles the description of *Acidalia pannaria* Guenee, but differs in detail. Two specimens taken in the latter part of July.

BOTYS PLUMBICOSTALIS *Grote.* ♂. Bright yellow. Costal region of primaries broadly dark plumbeous from base to tip. Terminal space outwardly filled with the same shade tapering to internal angle. This



terminal dark shade is outwardly rounded along its inner margin, and this is widely and everywhere nearly equi-distant from the external transverse line; at the internal angle there is a slight projection corresponding with the inward inferior inflection of the external line. The orbicular spot is reduced and absorbed above by the dark costal region, as is the reniform; the latter is small, constricted, with a dark annulus, and very narrow pale centre; both spots concolorous with the dark costal region. There is a short, dark, inner transverse line. The only other, the external, runs slightly *inwardly* below costa, then outwardly over the m. nervules, where it is slightly interspaceally dentate; thus, in its upper half it is sinuate or somewhat S-shaped. At 4th m. nervule, it runs, as usual, inwardly, thence transversely, to internal margin. The fringes are dark, concolorous with the terminal shade. A single line crosses the secondaries, projects over the disc, and corresponds to the external line of the primaries. A distinct discal dot. Apical angle shaded with plumbeous; fringes, pale. Beneath, whitish, iridescent, markings of the upper surface faintly reflected. Legs white; anterior and middle femora, marked with black. Palpal tips, front and vertex, and sides of thorax in front, dark. Thorax, clear yellow. Abdomen above, yellowish, with a dark dorsal shade; beneath the body parts are white. Hind legs entirely white, with two pair of unequal spurs. Exp., 30 m. m. August. Type in Mus. Peabody Academy of Science, Salem, Mass. Nearly as large as *B. flavidalis* Guenee, and very conspicuous by the dark shades of anterior wings.

Botys anticostalis *Grote.* ♂ ♀. Bright yellow, with deeper ochreous tinges. This species has the markings and appearance of *Botys plumbicostalis*. Costa of primaries broadly plumbeous, but shading to yellowish towards the tips. Ordinary spots larger, annulate, freer from the costal shade; their centers are whitish iridescent; the ♂ has no orbicular, in its place the tegument is somewhat pellucid and impressed. The two transverse lines are fainter and wider apart; the transverse exterior differently shaped. This is *outwardly* rounded at costa, where it is twice interspaceally lunulate, and there is always here a narrow space between it and the terminal dark shade. This latter fills in the entire terminal space superiorly, (except as above mentioned) between the external line and the margin, but is obsolete inferiorly below 3rd m. nervule, appearing as a spot at internal angle. Secondaries with a distinct discal spot and single transverse line. Apices with the commencement of

a dark terminal shade. Fringes on both wings pale. ♂ abdomen pointed at the tip, elongate with dark dorsal shade; ♀ yellow above. Thorax yellow; bread, palpal tips, sides of thorax before insertion of wings, dark as in *B. Plumbicostalis*. Legs whitish; anterior and middle pair shaded with blackish. Exp. 25 m. m. July- August. Types in Mus. Peabody Academy of Science, Salem. Mass.

Smaller than *Botys plumbicostalis*, but greatly resembling it at first sight. On a comparison the difference above detailed are quite apparent.

Besides the foregoing two species of *Botys*, I have taken the following Pyralidæ in the same locality, the two first in single specimens: *Botys laticlavia* G. R., *Botys plectilis* G. R., *Conchylodes platinalis* Lederer, *Stenophyes serinalis* Lederer, *Phakellura hyalinata* Milding, *Phakellura nitidalis* G., *Desmia maculalis* Westw., a species of *Crocidophora* allied to and perhaps the same as *C. pustuliferalis* Lederer, and *Cindaphia bicoloralis* (*Asopia bicoloralis* Guenee).

LIST OF COLEOPTERA.

TAKEN AT GRIMSBY, ONT., BY J. PETTIT.

Continued from page 151, vol. II., CAN. ENT.

CERAMBYCIDÆ.

PARANDRA, *Latr.*
brunnea, *Fabr.*
ORTHOSOMA, *Serv.*
cylindricum, *Fabr.*
TRAGOSOMA, *Serv.*
Harrisii, *Lec.*
EBURIA, *Serv.*
quadrigeminata, *Say.*
CHION, *Newm.*
garganicum, *Fabr.*
ELAPHIDION, *Serv.*
*atomarium, *Drury.*
vicinum, *Hald.*
ELAPHIDION, *Serv.* (*continued*).
mucronatum, *Say.*
villosum, *Fabr.*
parallelum, *Newm.*
*pubescens, *Hald.*
*unicolor, *Hald.*
notatum, *Fr.*
CRIOCEPHALUS, *Muls.*
rusticus, *Linn.*
agrestis, *Kirby.*
ASEMUM, *Serv.*
moestum, *Hald.*

*Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

ARHOPALUS, *Serv.*
fulminans, *Fabr.*
CALLIDIUM, *Fabr.*
violaceum, *Linn.*
lignum, *Fabr.*
*amoenum, *Say.*
janthinum, *Lec.*
PHYMATODES, *Muls.*
proteus, *Kirby.*
TYLONOTUS, *Hald.*
bimaculatus, *Hald.*
PHYSOCNEMUM, *Hald.*
brevilineum, *Say.*
CLYTUS, *Fabr.*
speciosus, *Say.*
nobilis, *Harris.*
flexuosus, *Fabr.*
erythrocephalus, *Oliv.*
luscus, *Fabr.*
campestris, *Oliv.*
hamatus, *Say.*
*4-maculatus, *Hald.*
CYRTOPHORUS, *Lec.*
verrucosus, *Oliv.*
OBRIUM, *Serv.*
*rubrum, *Newm.*
EUDERCES, *Lec.*
picipes, *Fabr.*
STENOPTERUS, *Illig.*
sanguinicollis, *Oliv.*
MOLORCHUS, *Fabr.*
mellitus, *Say.*
HELIOMANES, *Newm.*
bimaculatus, *Say.*
ACANTHODERES, *Serv.*
decipiens, *Hald.*
GRAPHISURUS, *Kirby.*
*pusillus, *Kirby.*
fasciatus, *Geer.*
AEDILIS, *Serv.*
obsoletus, *Oliv.*
LEPTOSTYLUS, *Lec.*
aculiferus, *Say.*
variegatus, *Hald.*
commixtus, *Hald.*
macula, *Say.*
LIOPUS, *Lec.*
*alpha, *Say.*
symmetricus, *Hald.*
*signatus, *Lec.*
*rusticus, *Lec.*
*querci, *Fitch.*
maculatus, *Hald.*
aspersus, *Say.*
ECYRUS, *Lec.*
*dasycerus, *Say.*
EUPOGONIUS, *Lec.*
*vestitus, *Say.*
subarmatus, *Lec.*
POGONOCHERUS, *Meg.*
mixtus, *Hald.*
*nubilus, *Lec.*
MONOHAMMUS, *Latr.*
dentator, *Fabr.*
confusor, *Kirby.*
scutellatus, *Say.*
GOES, *Lec.*
tigrinus, *Oliv.*
oculatus, *Lec.*
TETRAOPES, *Dalm.*
tornator, *Fabr.*
PSENOCERUS, *Lec.*
pini, *Oliv.*

DORCASCHEMA, *Lec.*
nigrum, *Say.*
SAPERDA, *Fabr.*
calcarata, *Say.*
tridentata, *Oliv.*
vestita, *Say.*
CYRTINUS, *Lec.*
*pygmaeus, *Hald.*
OBEREA, *Meg.*
amabilis, *Hald.*
tripunctata, *Fabr.*
DESMOCERUS, *Serv.*
cyaneus, *Fabr.*
RHAGIUM, *Fabr.*
lineatum, *Oliv.*
TONOTUS, *Serv.*
decoloratus, *Harr.*
trivittatus, *Say.*
*cylindricollis, *Say.*
*Schaumii, *Lec.*
ENCYCLOPS, *Newm.*
coeruleus, *Say.*
EVODINUS, *Lec.*
monticola, *Rand.*
ACMAEOPS, *Lec.*
proteus, *Kirby.*
ANTHOPHYLAX, *Lec.*
malachiticus, *Hald.*
*alternatus, *Lec.*
STRANGALIA, *Serv.*
subhamata, *Rand.*
bicolor, *Swed.*
quagga, *Germ.*
fugax, *Fabr.*
lugubris, *Say.*
lineola, *Say.*
*cruentata, *Hald.*
LEPTURA, *Linne.*
canadensis, *Oliv.*
biforis, *Newm.*
vittata, *Oliv.*
vagans, *Oliv.*
sphaericollis, *Say.*
mutabilis, *Lec.*
pubera, *Say.*
8-notata, *Say.*
scalaris, *Say.*
subargentata, *Kirby.*
*propinqua, *Bland.*
proxima, *Say.*
capitata, *Newm.*
ruficollis, *Say.*

THE NUMBER OF INSECTS.—The number of described species of insects is estimated by Gerstaecker at above one hundred and sixty thousand, viz.: Coleoptera, ninety thousand; Hymenoptera, twenty-five thousand; Diptera, twenty-four thousand; Lepidoptera, twenty-two to twenty-four thousand.—*Nature.*

CLASSIFICATION OF MOTHS.—The great work by the Messrs. Felder on the Lepidoptera of the Novara (an Austrian) Exploring Expedition, will be completed this year. It will contain a complele classification of the moths, and will supplement Guenee's work on them.—*American Naturalist.*

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

[Continued from page 88.]

LITHOCOLLETIS.

Sub-div. b, with an apical streak instead of spot.

* With a basal streak.

† *With dorsal and costal streaks.*

11. *L. crataegella* Clem., *loc. cit.*

All of my specimens have a very pronounced though rather short white *dorso-basal* streak, which is sometimes continuous with a longitudinal median white streak upon the thorax, and in all of them the *median* basal streak is continuous with a white line across the anterior margin of the thorax, which is extended backwards over the tegulae. The dorso-basal streak and the markings of the thorax and tegulae are not mentioned by Dr. Clemens. But these thoracic markings are very variable in a great many species. In some specimens of some species no trace of them is visible; in others they are very faint; and in others they are pronounced and distinct.

The larva mines the leaves of the Apple, Wild Cherry (*Prunus serotina*), Haw (*Crataegus*) and Sweet-scented Crab (*Pyrus coronaria*), on the under side. It is of the first group, and the mine is tentiform. Dr. Clemens records of it, that it quits one mine to form another—in which it is singular.

There is considerable variation in the shades of coloring, some species being much more golden than others, and the same specimen varies in this respect with the light. *Al. ex.* $\frac{3}{16}$ to $\frac{1}{5}$ inch.

Common in Kentucky, and probably wherever in America its food plants are found.

Sub-div. c. No apical spot. Apex dusted.

* No basal streak.

† *No fascia, but with dorsal and costal streaks.*

12. *L. nonfasciella. N. sp.*

Face and palpi white, tuft white, mixed with pale golden; antennae white, each joint tipped with fuscous above; thorax and anterior wings

mixed whitish and pale golden, with a few dispersed fuscous scales, and some irregular patches more thickly dusted with fuscous, especially in the apical portion of the wing, which is dusted with fuscous. The anterior and lateral margins of the thorax and the wing along the fold and across the middle are paler than the other portions, but not sufficiently so, nor definite enough in outline, to call them streaks or fasciae. *Al. ex.* ¼ inch. Two specimens captured in May in Kentucky. Larva unknown. The style of coloration is that of a *Bucculatrix*, but it has palpi.

13. *L. Bethunella. N. sp.*

Face and palpi silvery white; antennae silvery white beneath, brownish banded with white above; tuft golden, interspersed with white; thorax and anterior wings reddish-orange, with three costal and three dorsal silvery streaks, all dark margined externally. First costal and first dorsal small, the dorsal being the largest and nearer to the base, whilst the costal is a little oblique and at about the basal ⅓ of the wing. The second dorsal and second costal about the middle, opposite each other, and a little oblique, the dorsal being the longest, and almost meeting the costal near the costa, whilst their dark margins do meet and are posteriorly angulated and produced to the space between the third dorsal and third costal. The third dorsal and third costal are a little behind the apical ⅓, opposite, straight, and the dorsal is the longest. Apex dusted with blackish on a white ground. Ciliae fulvous, with a dark-brown hinder marginal line at their base. *Al. ex.* a little over ¼ inch. It bears a strong resemblance to, but is not by any means identical with, the species next mentioned, *L. Caryæfoliella*, in some of the varieties of *L. Caryæfoliella*.

The larva is of the second (flat) group. It is yellowish, and the maculae are ferruginous-brown. The mine is an oval blotch on the upper surface of the leaves of Black Oaks (*Quercus tinctoria*). Kentucky: rare.

I take the liberty of naming it in honor of the Editor of the CANADIAN ENTOMOLOGIST.

†† *With one or more fasciae.*

14. *L. Caryæfoliella.* Clem., *loc. cit.*

This is a variable species. Sometimes the first fascia is not a fascia at all, but is only a long oblique dorsal streak not quite attaining the

costal margin. Sometimes the second fascia is distinctly interrupted near the costa, and frequently its dark margin is not produced. *Al. ex.* ¼ in.

Larva of the second group; makes a flat mine on the upper surface of leaves of Hickories *(Carya)*, and when complete the mine is drawn into a pucker along the middle.

Wisconsin, Kentucky, Pennsylvania. Common.

15. - *L. tri-tæniancella. N. sp.*

Face and palpi white; tuft and thorax golden; antennae white-banded above with fuscous; anterior wings reddish saffron, with three white fasciae, each narrowly dark-margined *internally*, the first before the middle, the second about the middle, and the third about half-way between it and the apex, and slightly angulated posteriorly. Apex slightly dusted with brown on a white ground. *Al. ex.* about ¼ inch.

A single specimen, captured in April in Kentucky. Larva unknown.

16. - *L. guttifinitella.* Clem., *loc. cit.*

Dr. Clemens describes this species as follows: - "Front silvery, with a reddish hue; tuft and thorax reddish orange; antennae blackish brown: fore-wings rather deep reddish orange, with two silvery bands black-margined behind, one in the middle nearly straight, the other midway between this and the base of the wing obliquely placed. Before the costo-apical cilia is a costal silvery spot, black-margined on both sides, with an opposite dorsal spot black-margined behind. The apical portion of the wing is dusted" (thickly so) "with dispersed blackish scales" (on a white ground), "with a white silvery spot near the tip above the middle of the wing." (The position of this spot or streak is variable; it is anywhere near the apex.) "There are two hinder-marginal lines, one, the margin of the dispersed scales, the other dark-brownish in the ciliae." The costal and dorsal white spots near the apex are sometimes straight and sometimes more or less oblique, and the dorsal one is frequently confluent with the apical spot. Usually there is no basal streak, but frequently the anterior margin of the thorax is pale, or even white, that color being produced back over the tegulae to the base of the wings, forming a small median basal streak which is occasionally dark-margined. The first fascia is sometimes distinctly interrupted near the costa, and the second fascia is sometimes dark-margined *internally* on the costa. Sometimes the costal spot (near the apex) is faint, or even entirely wanting. Sometimes the whole apical portion of the wing is dusted, and sometimes the dusting is

confined to the dorsal margin. The larva is of the second group, and is described in the table appended. It makes a flat *whitish* mine on the upper surface of the leaves of the Poison Ivy or Oak *(Rhus toxicodendron)*. Sometimes there is only a single larva in a mine, and then the mine is either an irregular blotch or a narrow band, like the mark made by a drop of water running over a smooth surface. But usually there are several larvae in a mine—frequently six or seven—and then the mine covers nearly the entire upper surface. The pupa lies in a small circular depression in the mine, in an oval flat white cocoon.

Variety *L. Esculisella*. *Var. nov.*

The imago is not distinguishable from that of *L. guttifinitella*, but the larva differs decidedly in its markings, as shown by the table annexed, and approaches more nearly the larva of variety *Ostryarella* of the next species *(L. Corylisella)*, (the larvae of which differ also, that of *L. Corylisella* resembling that of *Guttifinitella*). I have never found more than one larva of this variety in a mine. The mine is a narrow band and *blood-brown* in color, thus differing from the above. The mines and larvae, therefore, differ, while the imagines are the same. These differences, not great, are constant. *Al. ex.* ¼ inch. Kentucky, Pennsylvania. Abundant. Mines upper surface of leaves of the Buckeye *(Æsculus glabia)*.

17. *L. Corylisella*. *N. sp.*

The only difference between this species and *L. guttifinitella* in the imago is, that this has a straight dorsal white streak at the inner angle, internally dark-margined, and the apical dusting is much less dense and much paler, and, in some lights, scarcely visible. The mine is an irregularly *circular* blotch, *brownish-yellow* in colour, with a pale yellow border on the upper surface of the leaves of the Hazel *(Corylus Americana)*, thus differing from both of those above-named. The larva resembles that of *guttifinitella* rather than its variety, *Esculisella*, but differs from both, as shown by the annexed table.

Al. ex. ¼ inch. Wisconsin. Kentucky. Common.

Variety *Ostryarella*, mines the upper surface of the leaves of *Ostrya virginica*. The mine and the imago are not distinguishable from those of *L. Corylisella*. But the larva differs from it, and bears the same relation to it that var. *Æsculisella* does to sp. *guttifinitella*. Kentucky. Common.

The following table shows the differences in the larvae above-mentioned :-

L. Corylisella.	*L. guttifinitella.*	*L. Excelsiella.*	*L. Ostryæella.*
Blueish, smoky, except the head and anal segment, which are yellowish.	Blueish, smoky, except head, 1st, 8th and following segments, which are yellowish.	Whitish yellow, not at all smoky.	Same as *Excelsiella.*
Translucent spots on segments, 1, 2, 3, 6, 7 and 8.	Translucent spots, as in *Corylisella.*	Translucent spots indistinct.	Translucent spots not visible.
Macula of seg. 1 indistinct.	Macula more distinct.	Macula not visible.	Only posterior angles of the macula visible.
Macula on segs. 2 to 9 distinct.	Macula on segs. 2 to 7 distinct.	Maculæ visible on all the segments.	Sides of macula of seg. 2 obsolete, others all distinct
Maculæ of segs. 1, 2 and 3 trapezoidal, 4 and 5 elliptical, 6, 7, 8 and 9 parallelograms.	Maculæ 1, 2, 3, trapezoidal, the others parallelograms.	Same as *guttifinitella.*	Same as *guttifinitella.*
Maculæ dark brown, except first and last ones.	Maculæ 1 to 7 dark-brown, the others yellowish.	Maculæ pale brownish.	Maculæ all brownish.
Maculæ solid.	Maculæ hollow.	Maculæ hollow.	Maculæ hollow.

These differences I have found to be constant, and that in the general colour is striking.

THE NISONIADES BUTTERFLIES.

BY H. W. PARKER, AMHERST, MASS.

I WRITE no less to elicit information, than to offer such as my limited material affords. In a very interesting and original paper on Asymmetry, published by the Boston Soc. Nat. Hist. 1869-71, Messrs. Scudder and Burgess describe and figure the genital armor of all our species of *Nisoniades*, making seventeen species, of which nine are new. Their *Virgilius* I have not, and doubt its validity, my specimens of *Horatius* having a mixture of the characters of the two species; the specimens differ somewhat from each other in armor, and, what is puzzling, are very different in size, though wonderfully alike in colouring, and very unlike

all our Northern species in one respect to be mentioned. If my observations are correct, much the same may be said of the armor of *Ennius* and *Juvenalis*, which latter species is separated as Southern by Messrs. Scudder and Burgess, but seems to be identifiable as a variety found in Amherst, Mass.; and these two appear to intergrade somewhat in style of markings.

Mr. Lintner is expected to publish a full description of several of the species previously ascertained by him. Meantime, our Northern species may perhaps be characterised in a few words.

SIZE. *Ennius*, *Juvenalis* and one *Horatius (?)* are the largest, and all about 1 1/2 inch. *Brizo* is next, 1 3/8 to 1 5/8. *Martialis* next, 1 1/4. Then *Persius* and *Lucilius*, 1 1/8. Lastly, *Icelus*, 1 1/8 to 1 1/3.

MARKINGS. *Icelus* alone is without white (transparent) dots; *Brizo* none in the male, or obsolete; *Persius* alone has the sub-apical dots in a straight line. *Juvenalis*, *Brizo* and *Persius* incline to fine pencilling on the primaries; the rest to blotchiness; *Icelus* somewhat to both. *Brizo* alone has the inside of the extra-discal band of spots forming an almost continuous and nearly straight dark line on the primaries. Only in *Brizo* and *Icelus* the light spots on the secondaries tend to appear small, sharp and bright on the upper surface, at first glance. *Horatius* alone has the submarginal spots on the secondaries so far straightened as to lose the form of a broad W, observable in the other species mentioned, and all the cloudings of both wings melt more into the ground color. *Persius*, when fresh, has the primaries much darker than in the other species: and *Martialis* has the cloudings much stronger.

In the above, I speak only of the upper surface of the males of northern species. The females I have sorted with less confidence; two specimens have the spots of the secondaries arranged as in the male *Horatius*.

HINTS FOR PACKING.—In sending pupæ or eggs by mail it is best to wrap them lightly in thin tissue paper and then pack the box with cotton wool. Do not put the latter, next to the pupæ or eggs, as it is very apt, by getting worked into the crevices, to be the means of somewhat injuring the specimens. We are indebted for this hint to Dr. G. M. Levette, of Indianapolis, and our own experience fully confirms the wisdom of his suggestion. ED. CAN. ENT.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 94.)

[90.] 125. ALEOCHARA PALLITARSIS, *Kirby.*—Length of body 2 lines. Locality unknown.

The species of this genus of minute *Brachelytra* are so extremely numerous, nearly 200 having been discovered in Britain alone, and so difficult to discriminate, that it is not with great confidence that I give this as a nondescript. I have many undescribed species in my cabinet that come very near it, but I cannot find one that altogether agrees with it.

Body black, gloss deadened by short inconspicuous hairs. Head rather spherical, narrower than the prothorax, very minutely punctured: antennae shorter than the prothorax, rather robust, intermediate joints turbinate, last joint ovate, acute: prothorax sub-orbicular with the sides deflexed, very minutely and thickly punctured; dorsal channel nearly obsolete; a large punctiform impression just above the scutellum: elytra longer and rather wider than the thorax, piceous-black, extreme tips rufous, very minutely and thickly punctured: legs piceous-black with rufous tarsi.

126. TACHYPORUS ACUDUCTUS, *Kirby.*—Length of body 1 line. Taken near Cumberland-house, lat. 54°.

[91.] Body dark-piceous, naked, smooth, glossy. Antennae and mouth testaceous: prothorax very smooth, wider than the elytra, posterior angles testaceous: elytra longer than the head and prothorax together, piceous with the external apical angle testaceous; if viewed under a good magnifyer, they appear covered, especially next the suture, with minute branching scratches, as if made by a pin or needle, intermixed with very small punctures; abdomen very short and conical, scarcely margined, piceous with the segments paler at their tip.

127. TACHYPORUS AFFINIS *Kirby.*—Length of body, 1 line. Taken with the preceding species. This species is extremely similar to *T. acuductus*, but the posterior angles of the prothorax are not testaceous: the elytra are palish-chestnut and thickly covered with very minute punctures, without any scratches.

128. PHILONTHUS POLITUS *Linn.*—Length of body, 5 lines. Taken in Nova Scotia by Capt. Hall.

[92.] Body very black, hairy. Head orbicular, scarcely narrower than the prothorax, naked with the exception of a few long lateral bristle-like hairs, slightly bronzed, very glossy, smooth with a few punctures on each side in the occiput; antennæ shorter than the prothorax, last joint emarginate at the tip; prothorax, rather narrowest before and transverse, rounded behind, slightly bronzed, very glossy and smooth, with a few long hairs on each side, on the disc is a double series, each consisting of four punctures, there are three or four others in the sides; elytra bronzed, thickly punctured, with a long hair issuing from each puncture; claws of the tarsi ferruginous. [In LeConte's List, put down as a male and synonymous with *P. aeneus* Rossi - a species taken in Canada.]

129. PHILONTHUS MANDIBULARIS *Kirby.*—Length of body 5 lines. Locality unknown.

[93.] This species differs from the preceding chiefly in the shape of the head, and the color of the mandibles, agreeing in the former particular with *P. politus* of modern Entomologists, from which it differs, besides their colour, in having the mandibles shorter than the head; the intermediate joints of the tarsi also are rufo-piceous. [Inserted in LeConte's List as the female of the preceding species.]

130. PHILONTHUS PICATUS *Kirby.*— Length of body 3 lines. Two specimens taken in Lat. 54°.

Body piceous, as usual in the genus somewhat hairy. Head ovate, naked, and very glossy, with a few scattered punctures on each side behind the eyes and four between them; antennæ as long as the head and thorax, scape testaceous; prothorax naked and very glossy; dorsal rows consisting of six punctures, there are five more punctures near the anterior margin arranged in two oblique rows between them and the lateral margin, and three or four other punctures are discoverable nearer the base: elytra chestnut, hairy; tips of the abdominal segment and anus rufous: legs testaceous. [Previously described as *Staphylinus (Philonthus) brunneus* Grav. Taken on the north shore of Lake Superior by Agassiz's Expedition.]

131. PHILONTHUS FULVIPES? *Grav.* Length of body about 3 lines. A single specimen taken in lat. 54°.

Body black, hairy, except the head and prothorax which are naked, and very glossy. Head sculptured like that of *P. picatus;* antennae with the two first joints testaceous: prothorax sculptured with regard to the dorsal series as in that species, then follow about five punctures in an irregular wavy series extending from near the base towards the apex, between which and the anterior angle are two placed obliquely, and several besides are discoverable in the lateral and posterior margins: [94] the scutellum is black: the elytra punctured, testaceous, and hairy: the abdomen is entirely black; the legs are testaceous with the posterior coxæ black; the hands are not dilated. [Taken at Grimsby, Ont., by Mr. Pettit.]

132. STAPHYLINUS CHRYSURUS, *Kirby.*- Length of body 5½ lines. Taken in Nova Scotia by Dr. MacCulloch.

Body underneath black, somewhat glossy, sprinkled with yellow hairs. Head suborbicular, scarcely wider than the prothorax, confluently punctured, bronzed, and covered not thickly with short pale-yellow hairs, which give it a cinereous tint, with several indistinct blackish spots; rhinarium and upper-lip pale yellow; mandibles rufous at the base; stalk of the antennae testaceous, the six last joints are brown and larger than the rest, so as to form a clava: prothorax sculptured, cloathed, and coloured like the head, but more distinctly spotted and clouded with black, widest behind with a slight lateral sinus near the base: scutellum almost covered by a heart-shaped velvetty black spot: elytra, as to sculpture, cloathing, and general colour, resembling the head and prothorax, but they are differently spotted with black; in the centre of the base is an oblique oblong spot, then follows an angular interrupted band, and lastly, is a sickle-shaped band with the handle towards the lateral margin, the blade is very broad and includes an insulated cinereous spot; neither of these bands reach the suture or the lateral margin, which is tawny-yellow: the two last segments of the abdomen, especially the penultimate, are thickly covered with short decumbent hairs, which in certain lights reflect a brilliant golden lustre; the after-breast is covered with hairs if possible still more brilliant; the legs are testaceous, but the thighs except their tip, and a dorsal line, are black.

This species resembles *St. hybridus* and *maculosus*, but is sufficiently distinguished by its golden tail and breast: it is one of the smallest of the genus. [Previously described as *Leistotrophus cingulatus* Grav. Not uncommon throughout Ontario.]

MISCELLANEOUS NOTES.

ANNUAL MEETING.—In accordance with the Act of Incorporation, the annual meeting of the Entomological Society of Ontario will be held at Kingston, Ont., on Wednesday evening, Sept. 27th, 1871, when the annual Report will be read, with the Treasurer's statement, and officers for the ensuing year will be elected.—ED. CAN. ENT.

FRIENDLY NOTES.— I see you have published a little scrap in No. 3 CAN. ENT., "by C. V. Riley, State Entomologist of Missouri, St. Louis." I had to laugh at the mountain you have made of the mole heap, and, in future, if you care to use any of my scribblings in print, I must insist that you follow copy, and omit the "handles." I have no particular fondness for the latter, and they seem to be especially out of place at the head of trifling communications.

While spending a few hours with Mr. Scudder, recently, I found, upon comparing notes, that he had not observed the difference in length in the larval horns of *Disippus* and *Ursula*, and that, if anything, his descriptions made those of the former longer than those of the latter - or the exact converse of what I described in the article above referred to. I mention this fact that you may note it in your future observations, and perhaps it would be well to call attention to it in the CAN. ENT., that others may also give us their experience. Mr. Scudder had, however, remarked the differences in the pupal humps; but, in describing, he speaks of the "posterior and anterior sides" of this hump instead of "upper and lower edges"—thereby imagining the pupa in a detached and horizontal, instead of the suspended vertical position as I have done. Mr. Scudder has noticed some other differences in the two pupæ, and I draw your attention to these differences, in order that you may make further comparisons. He finds that, while in *Ursula* the shoulder (basal wing tubercle) is rounded off and partially suppressed, in *Disippus* it is produced into a minute conical point, directed outwards (and in *Arthemis* [one specimen only observed] less pointed and directed backwards). In *Disippus* he finds the dorsal portion of the "anal button," within the marginal ridge, to be longer than wide, while it is more nearly square in *Ursula*. He also thinks the latter is a little stouter and more constricted at the mesothorax, viewed dorsally. From an examination of several empty pupa shells of both species, I doubt whether any of these characters, taken singly, are of as much value as those I have given, but they will all help us to separate

the two species in their preparatory stages. Characters of single specimens are of little value, and true distinction can only be arrived at by the examination of many individuals. Thus, I possess one *Ursula* pupa, so conspicuously marked with black spots and streaks on the edges of the dorsal hump, of the wing and leg sheaths, of the shoulder, and of the ear-like prominences of the head, that, taken singly, these would form striking characters: but in others, again, these marks are either illy defined, or entirely obsolete.

I am really rejoiced to see your little work prospering so well and improving so much. I am glad to see that Mr. V. T. Chambers is taking up the Micros. It is a vast and most interesting field, and I hope Mr. C. will prove a second Clemens to us, for we are sadly in need of one! There is something rather incoherent in Mr. Wm. Couper's articles, and he has committed some serious errors. Firstly, if he wishes to instruct in Entomology, he must not talk of the "family of Hymenoptera" (p. 35. l. 24). Secondly, he ought to know that curculionidous larvae do not spin silken cocoons; and by referring to the third Missouri Entomological Report, he will find that we do know something of the habits of quite a number of our snout-beetles. The larva in acorns which he describes on page 65 is, as I am quite convinced from his text, no Curculionid at all, but an inquilinous moth-larva, in which he has rather carelessly overlooked the legs. It produces a little ash-gray moth, characterized chiefly by having on the front wings two distinct discal spots on an usually silvery gray ground, and a transverse pale stripe across the basal third of the wing, well relieved posteriorly by a dark median shade. It varies much in size and conspicuity of markings, but the average expanse is about ¾ths of an inch. The moths issue all along from the end of April till Sept. The larva is found in all kinds of acorns, especially in those that have been injured or infested by the acorn weevil (*Balaninus rectus*, Say), and the small [it is generally 0.05 inch in diameter] circular hole, observed by Mr. Couper, and supposed by him to be made by the parent for the deposition of its egg (?), is but the hole by which the *Balaninus* larva escaped to go into the ground, and which the inquilinous moth-larva covers up with silk after it comes to occupy the acorn. I took specimens of this moth to Europe with me, but could not find that it was described. It apparently belongs to the genus *Gelechia*, and I propose for it the name of *G. glandulella*. I have found its larva (in company with those of a

Cecidomyia and of another *Tinean*) in acorns of *Quercus ilicifolia* which were still on the tree, and which were infested with a little pip-like gall, between the acorn and the cup.*

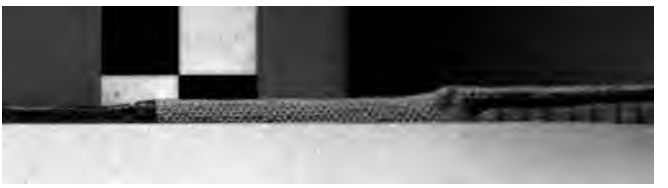
To one who has watched with interest, the writings of Messrs. Scudder, Lintner, and Edwards on *Grapta interrogationis*, Fabr., the article by the latter gentleman on page 70, is extremely gratifying. From the fact, that in Europe, *Grapta C-album* shows three very distinct variations, and from my own breeding experience with *interrogationis*, I felt convinced that the black-winged and red-winged forms were but varieties of the one species, and so informed Mr. Lintner, over a year ago. I am glad Mr. Edwards has anticipated me in demonstrating it in print. Such facts ought to give impetus to the rearing of insects; for though the artificial method of making species out of every little individual variation may be very amusing to those who choose to indulge in it, yet such work will never give us a natural system, and much of it will have to be undone by subsequent investigators who acquaint themselves with the adolescent as well as the perfect forms of a species.

C. V. RILEY.

St. Louis, Sept., 10th, 1871.

HOW TO PRESERVE EPHEMERIDÆ.—In drying, the color and form of Ephemeridæ soon change. Color is of little importance, even in fresh examples; but form is necessary to the distinguishing of the species. They are, therefore, best preserved in a liquid. It is sufficient for ordinary purposes to dip the fresh killed specimen into diluted spirits, and then transfer it to a tube, or homœopathic globule bottle, partly filled with water. Next, Price's glycerine is added to the water—one or two drops a day—until the bottle is gradually filled. A small drop of acetic acid may be added finally, to prevent the growth of mould. The name of the species may be written on the disk of the cork, the date and locality of capture round its side. Hind wings of the species of Baetis and Centroptilum should be mounted on slips of grass, for microscopical examination. Pinned specimens are often difficult to determine, in consequence of their shrinking: to card them is to render them fit for nothing. EATON'S *Ephemeridæ*.

* This little gall is undescribed. In company with Mr. H. F. Bassett, of Waterbury, Ct., I found it so abundant last month, that the acorns were very generally destroyed. Strange as it may appear, from observations made by Mr. Bassett, this gall will, in all probability, prove to be but the summer form of the wooly gall known as *quercus operator*—so little do we know yet of some of Nature's secrets!



EXCHANGES, &c.

The undersigned would be pleased to open communications with any Entomologist in Canada, United States or England with a view to exchanging specimens. Address JAMES COLWELL, care of A. CHOUN, Kingston, Ont.

THE undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address EDW. L. GRAEF, 40 Court St., Brooklyn, N. Y., U. S.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

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AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.: J. Y. Green, Newport, Vt.: W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. III. LONDON, ONT., OCTOBER, 1871. No. 7.

ANNUAL ADDRESS

OF THE PRESIDENT OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO, 1871.

To the Members of the Entomological Society of Ontario:

Gentlemen,—It is with no ordinary feelings of pleasure and satisfaction that I offer you my congratulations upon the continued success and prosperity of the Entomological Society of Ontario. We are now met together to hold our *first* Annual Meeting under our Act of Incorporation, and as a public Society duly recognized by the Government of the Province, and closely associated with the Agricultural and Arts Association of Ontario, who are now holding their great Annual Exhibition in this city of Kingston. As we have now attained to a position so much superior to anything we anticipated a few years ago, it may not be amiss to give a brief account of the origin and progress of the Society, and of the work it has been able to accomplish.

The origination of the Society may be traced to the publication in the number of the *Canadian Naturalist and Geologist* for June, 1862, of a "List of Entomologists in Canada," prepared by Mr. Saunders of London, Ont., and myself. As this List contained the names of thirty-six persons interested in the collection and study of Insects, it was resolved to hold a meeting and endeavour to form a Society or Club of those engaged in this branch of Natural Science. In the following September, accordingly, ten gentlemen assembled at the residence of Prof. Croft in Toronto, and decided upon the formation of an Entomological Society whose objects should be (1) the preparation of as complete a collection as possible of Canadian Insects, to be kept in some central place for general information and reference; (2) the charge of a depository of duplicate specimens contributed by Entomologists for distribution amongst its members; and (3) the holding of meetings from time to time for mutual information and the advancement of the science throughout the country at large. As so few were present at this meeting, no definite organization was attempted at the time, but the matter was laid over until the following spring.

On the 16th of April in the following year (1863), the Society was at length duly organized under the Presidency of Prof. Croft, and with Mr. W. Saunders as Secretary-Treasurer, and the late Rev. Prof. Hubbert as Curator. The names of about twenty-five persons were enrolled as original members. During the year, meetings were held from time to time, and several more names were added to the list of members.

The next year (1864) was one of great progress, being signalized by the formation, in March, of a Branch, with ten original members, at Quebec, Canada East; and of another in July, at London, Canada West, with thirteen original members. A preliminary list of Canadian Lepidoptera, embracing 144 species of Butterflies, Bombyces and Sphinges, was published by the Society during the year. In 1865 many additions to the roll of membership were made, and much good work was done, including the publication of a second list of Canadian Lepidoptera, containing the names of 350 more species. During the following year (1866) the Society held but few meetings and effected little, owing to the disturbance caused by the Fenian Raid, and the call made upon many members to leave their homes and join the ranks of the Volunteer service. The year 1867 was marked in the annals of the Society, by the publication of a valuable list of Canadian Coleoptera, which included no less than 55 families, 432 genera, and 1231 species, being many times more than had ever been previously enumerated in a Canadian List.

In August 1868, the Society issued the first number of the CANADIAN ENTOMOLOGIST, a small monthly periodical devoted to the publication of original papers on the classification, description, habits and general history of Insects. This little serial has been received with much favour by the leading Entomologists of America, many of whom have from time to time contributed to its pages. It has now reached the middle of its *third* volume, and has increased to three times its original dimensions; it has also improved much in style and typographical appearance, as well as in the excellence of its illustrations.

Until December 1869, the Society received no extraneous assistance nor public recognition, but depended wholly for its maintenance upon the efforts of its members. At that time, however, it was voted a grant of $400 for the year 1870 by the Board of the Agricultural and Arts Association of Ontario, on condition that it furnished an Annual Report, formed a cabinet of insects useful and prejudicial to agriculture and horticulture, and continued the publication of the CANADIAN ENTOMOLOGIST. These conditions were severally complied with by the con-

tinuance and improvement of our periodical, the formation of a cabinet of insects arranged in an economical point of view, and placed in the rooms of the Association at Toronto, and by the publication of a Report upon the Insects affecting the Apple, Grape, and Plum, prepared by Messrs. Saunders and Reed and myself. The singular favour accorded by the public to this Report, and the fact that an edition of three thousand copies was speedily exhausted, sufficiently attest its value.

The present year (1871) has been signalized by the Incorporation of the Society by the Legislature of Ontario, at the instigation of the Bureau of Agriculture, and the grant to its funds by the Government of $500 a year. By the same Act, moreover, your President is entitled to take his seat as an *ex officio* member of the Board of Agriculture and arts. Among the ranks of progress of the year, mention must by no means be omitted of the formation of a *third* Branch of the Society at Kingston, which we trust will long continue to grow and prosper.

Such, gentlemen, is a brief account of the origin and progress of our Society, the recital of which has not, I trust, proved uninteresting to you. When we look back upon our growth and development, we must all, I am sure, feel cheered and encouraged to continue our work and strive by our united efforts to make the ENTOMOLOGICAL SOCIETY OF ONTARIO a credit and a blessing to our land.

Before concluding, I feel that it is my painful duty to remind you of the loss which our Society and the cause of Natural Science generally in this Province has sustained in the recent death of Prof. Hincks, of University College, Toronto. He joined us in our first attempts at organization, and continued our steady friend and supporter till a few months ago. Though his special studies were chiefly devoted to another department of Nature, he yet took a lively interest in Entomology, and was a frequent attendant at our meetings. He died at a ripe old age, and has left a mark upon the scientific records of our country which will not soon be effaced.

Thanking you, gentlemen, for the honour you have done me in calling upon me to preside over you during the past year, and trusting that our Society will continue to grow and prosper, and be zealously maintained by us all,

I have the honor to be, gentlemen,

Your obedient servant,

CHARLES J. BETHUNE.

Kingston, Sept. 27, 1871.

DESCRIPTIONS OF LEPIDOPTERA FROM ALABAMA.

(Continued from Page 105.)

BY AUG. R. GROTE.

Specimens of the species alluded to in the present paper and types of the species described, are deposited in the Museum of the Peabody Academy of Science, Salem, Mass.

PYGARCTIA ABDOMINALIS *Grote.* ♀ This genus, allied to *Ctenucha*, is structurally characterized by the very small labial palpi, which are not porrected but concealed beneath the head; the dark scales which tip the small terminal joints are projected straightly forward but do not exceed the front. The antennæ are somewhat long and stout, shortly bipectinate. The legs are comparatively short, stout, feebly armed and closely scaled. The body parts are moderately heavy, smoothly and closely scaled; the abdomen is linear, terminates bluntly, and resembles that part in *Euchaetes*. It is not tufted at the anus. The moth is laden with Arctian analogies. The hind wings, of which alone the neuration has been examined, are 7-veined: veins 3, 4, 5, (*H.S.*) spring from one point, vein 2 is thrown off from the median nervure at about its middle, widely separate from the rest. The costal nervure is furcate at the outer third and throws off both nervules (veins 6 and 7, *H.S.*) on to the external margin. The internal nervure (vein 1, *H.S.*) is without accessory veins.

The wings are lead color; in certain lights the primaries show a bluish reflection as in *Ctenucha*. The costal region of the forewings above and below is striped with dark yellow as is the internal margin. The hind wings are concolorous immaculate. Abdomen above orange, with a dorsal series of distinct segmentary black spots as in *Spilosoma*, and other genera of *Arctinæ*; there is also a lateral series of black points; beneath it is lead color. Palpi, throat and head behind and between the antennæ bright orange; front dark as are the palpal tips. Legs dark lead color: fore coxæ orange. Collar tegulæ and thoracic disc lead color with a light reflection, and more or less obviously margined with orange scales and shades. Exp. 44 m. m. ♂ ignot.

PARORGYIA LEUCOPHÆA *Smith* sp. ♂ ♀ Specimens of this species have been collected by Mr. Ridings in Georgia, and Prof. Townend Glover has figured the female. Both the ♂ specimens I have seen have the primaries suffused with blackish. I have received specimens collected by a friend within a few miles of Demopolis. It closely resembles *P.*

paler, and the course of the inner transverse line is different. Hubner has figured the Northern species in illustration of *P. leucophæa*. Smith's *achatina* remains to be discovered; Dr. Packard's identification of it in the "Synopsis" being erroneous and not improbably founded on *Parorgyia tephra* Hubner sp. This latter, together with *P. plagiata* Walk. sp., and *Parorgyia clandestina* Walk. sp., as well as *Parorgyia rossii* Curtis sp., remain to be confirmed as distinct species.

Botys argyralis *Hubner* sp. The peculiar dark ventral stripe had not been noticed at the time that *Botys ventralis* G. R. was described synonymously. There is a considerable variation in the color of this species. I have taken here a specimen in which the primaries above and thorax are of a deep ochrey yellow. The exterior white dotted line is also variable in appearance; being at times partially obsolete. The abdominal stripe beneath varies in color with the fore wings and thorax.

Botys ecclesialis (*Samea ecc.* Guenee). I have taken a specimen of the form of this species described by Guenee from the United States. It has a distinct dot on the secondaries above at base. The specimens in the British Museum registered under the names of Samea elealis, Samea liparalis and Botys tædialis, appeared to me identical with our Northern Botys adipaloides. However, Lederer seems to have had the two latter before him from Brazil. I may then have mistaken closely allied species as identical. Undoubtedly some species of our U. S. Pyralidæ may be found in Brazil, but there appears to exist closely allied and what is termed representative species in the two countries. However, I can find no difference between our U. S. Cindaphia bicoloralis *Guenee* sp., and the figure and description of the Brazilian C. incensalis, *Lederer*. It will be better then to retain the name *adipaloides* for our species until its identity with any of the three mentioned above is more clearly established. I do not find the disproportional spurs on the hind legs of my specimens of *Samea ecclesialis*; it would appear then to belong to Botys.

Pilocrosis ramentalis *Lederer*. ♂ Antennæ with a tuft above the thickened basal joints, somewhat bent or crooked towards the middle, otherwise simple and in all my specimens rigidly elevated, curling over towards the tips. Primaries with a large hair-tuft at base extending along the costa to just beyond the first transverse line and drooping downwardly to internal margin. Hind legs with two pair of unequal spurs. Ornamentation of *Botys*. Above wings and body parts are concolorous obscure smoky brown, the former with a slight iridescent reflection. Two obscure

Clintonii, from the middle and Eastern States. The female is, however, yellowish white lines on primaries and a concolorous luniform discal streak; the outer line very sinuate, and with the discal streak margined darkly inwardly. A single line, corresponding to the outer line of the primaries, crosses the secondaries above, and these show a dark discal streak near the paler costal region. Abdominal segments above very finely lined with pale scales posteriorly. Beneath whitish; the terminal palpal joints dark. Exp. 28 m. m. The abdomen extends for ¼ of its length beyond the secondaries. I think I have also the female of this species; if so it does not differ from the male in its interesting antennary and alar characters. Lederer had only a defective specimen before him, the habitat of which was unknown. The present discovery of this singular genus in Alabama has, then, enabled me to supplement Lederer's description in one or two particulars.

DESMIA SUBDIVISALIS *Grote*. ♀ Antennæ simple. Lustrous black. Primaries with two ovate white spots above situate as in *D. maculalis*, but a little rounder in shape. The very black external transverse line, in its usual sinuate course, may be seen outside these spots edging the upper and outer spot entirely externally, the lower spot but partially. On the secondaries the usual white median band is medially constricted and separated by black scales, so that two ovate transverse and overlapping white spots are formed. Fringes dark, very faintly tipped with white. Abdomen with the usual sub-basal white band and spot above; anal segment entirely black. Beneath, the white spots of the wings are iridescent, and the division of the band on the secondaries is incomplete. Exps. 19 m. m. One third smaller than *D. maculalis*; the wings are relatively broader while similarly shaped; the fringes are less distinctly touched with white and appear shorter. I regret not to have found the male.

The above may be added to the list of Pyralidæ I have taken in my locality, as well as *Asopia farinalis*, *Botys marculeata* G. R., and *Botys flavidalis* Guenee.

ERRATUM.—In the last communication of our esteemed correspondent, Mr. Aug. R. Grote, we regret the appearance of a rather remarkable typograpical error, which escaped the eyes of both printer and proof-reader, on page 105, third line from top. For "bread," read "head."—ED. C. E.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 112.

LITHOCOLLETIS.

18.—*L. desmodiella* Clem., *loc. cit.*, p. 320.

This is the smallest known American species of the genus, if not the smallest of all known species of it, measuring scarcely 1/6 in. *alar. ex.* It is very pretty—to the naked eye sparkling like microscopic gems of different colours, or like diamonds set in rubies. The pattern of coloration resembles that of *corylisella*, but still more that of *Leucanthiza ornatella*, which it resembles closely, except that it is much smaller and lacks the iridescence and changeable colours of that insect.

Larva of the first group.—Mines the under surface of leaves of different species of Desmodium. I have met with it only in August and September and rarely then. Pennsylvania and Kentucky.

* * *With a basal streak.*

† *With fasciæ.*

19.—*L. ambrosiæella. N. sp.*

Face, palpi, undersurface, and legs (except a reddish-orange patch on the outside of the posterior tibiæ) deep steel-blue metallic. Antennæ dark brown, annulate with white. Tuft reddish-orange with white scales on each side. Thorax and anterior wings reddish-orange, with a snow-white streak crossing the anterior margin of the thorax, passing back over the tegulæ and continuous with a short median basal white streak on the wings and which is faintly dark margined behind. A wide snow-white costal streak about the basal 1/4th dark margined behind; a snow-white fascia about the middle of the wing dark margined distinctly behind and faintly so before. A costal white streak and an opposite dorsal one at the base of the ciliæ, both dark margined behind and faintly so before. A white fascia just before the apex becoming indistinct near the dorsal margin and faintly dark margined behind. Ciliæ of the general hue. *Al. ex.* 1/4 *in.*, Kentucky; common.

Larva cylindrical, yellowish, with the head streaked and suffused with fuscus. It makes a very small tent mine on the under side of the leaves of the "great hog weed" *(Ambrosia trifida)*. There is a very similar mine on the under surface of the leaves of *Helianthus gigantea*, but I have

not bred the moth from it. It is very different from another *Helianthus* mine yet to be described. The cocoon is fusiform, suspended in the mine by a thread from each end. So is the cocoon of the large *Helianthus* mine, and the larva only differs from this by wanting the fuscus marks about the head. But the mine is very different and resembles on the upper side a tubercular swelling of the leaf. I have not yet bred the moth from either *Helianthus* mine. I once found a large mine differing from all of these, but with the same kind of cocoon on the under surface of a weed *(Eupatorium ?)* at Macon, Georgia.

20.—*L. celtifoliella. N. sp.*

Face and palpi silvery white, the palpi on their outer surfaces saffron, flecked with brown. Antennæ brown, annulate with white and flecked with blackish scales. Tuft reddish-saffron with white scales intermixed. Thorax reddish-saffron anteriorly, passing into brown towards the apex, sparsely flecked with white, and with the usual white line (sometimes absent) across the anterior margin produced backwards over the tegulæ and on to the wings, where it is confluent with a narrow median white basal streak which is strongly dark margined dorsally, the dark margin being produced beyond it nearly to the middle of the wing. Anterior wings reddish-saffron, the dorsal margin nearly to the ciliæ thickly dusted with dark brown on a white ground, and with a streak of dark brown extending to the basal streak not far from the base. Three fasciæ, rather indefinitely bounded, of dark brown upon a white ground; all strongly angulated posteriorly about the middle, the third one slightly interrupted near the costa and passing gradually into a costo-apical patch of dark brown on a white ground. The first fascia is just before the middle; the second is about the middle and each sends a white streak from its angle nearly to the next fascia. There is a dorso-apical patch of dense dark brown dusting on a white ground, larger than the costo-apical one above mentioned. Ciliæ pale reddish-saffron with a dark brown hinder marginal line in the ciliæ. (Sometimes almost the entire thorax and dorsal margins of the wings are densely dusted with dark brown on a white ground, whilst the first and second fasciæ blend with each other near the dorsal margin, and the third fasciæ blends with the dorso-apical dusting. It varies in the extent and intensity of the dusting). Under surface silvery white with a patch of dark brown dusting on each side of each abdominal segment. Legs silvery white with the anterior tibiæ and tarsi reddish-saffron dusted thickly with dark brown, and the intermediate and posterior tibiæ and tarsi spotted and annulate with dark brown.

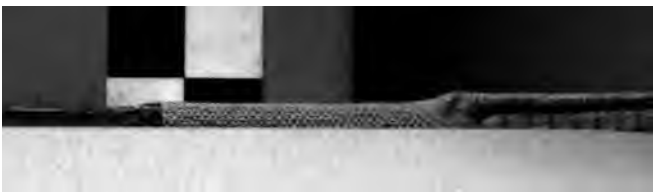
Alar. ex. ¼ inch. Kentucky. Not common.

The larva is cylindrical, yellowish, and makes a tent mine on the under surface of the leaves of the Hackberry *(Celtis occidentalis.)*

21.—*L. celtisella. N. sp.*

Face, palpi, and under surface silvery white, the under surface and legs tinged with yellowish; antennæ silvery, annulate above with dark brown. Tuft, thorax, and anterior wings saffron-yellow, with a white patch in the centre of the tuft and the usual white line across the anterior margin and sides of the thorax, which, however, as in other species, is sometimes wanting. When present it is confluent with the rather long narrow median basal white streak which is faintly dark-margined towards the dorsal margin. Just before the middle is a white fascia angulated near the costa and produced backwards at the angle, and strongly dark-margined *internally*. Near the base of the ciliæ is another straight white fascia not definitely bounded, anteriorly margined with dark brown and with many dark brown scales interspersed in the white, and sometimes divided into two or three rather indefinite spots. The apex of the thorax is white, and from it a narrow white line passes along the posterior margin of the wing to the first fascia, and sometimes is faintly indicated to the base of the ciliæ and is margined with dark brown. Apex dusted with dark brown on a white ground, the dusting margined by an oblique white line internally. Sometimes the dusting is not thick, and the whole apical half of the wings is sparsely flecked with dark brown scales. The markings of the apical half of the wing are all indefinite, the colors not being separated by distinct well-marked lines, but to some extent running into each other. *Al. ex.* less than ¼ in. Kentucky. Very abundant. There is some variation in the intensity of the color: some species being much paler than others, and one specimen in my possession has the thorax entirely white.

The larva mines the under surface of the leaves of the Hackberry *(Celtis occidentalis).* The mine begins near the midrib and the first portion of it is only discernible under a lens. It is only by observing this part of it that it is possible to tell on which side of the leaf the larva enters, as the remainder of the mine presents the same appearance on both sides of the leaf. It is a short narrow crooked line ending in a small ovoid dead-looking blotch which is slightly puckered along the centre on both surfaces. Like all other species it leaves the mine upon the same side on which it entered.



22.—*L. aceriella.* Clem., *loc. cit.*, *supra*, p. 323.

This is a very variable species both in the larva and imago. Frequently the anterior margin and sides of the thorax are white. Sometimes the basal streak is very short, at other times extending nearly ¼ the length of the wing. Dr. Clemens says there are two fasciæ; but in none of my specimens does the first one quite attain the costal margin, and usually it is only a short dorsal streak extending to, and confluent with, the basal streak; and sometimes nearly the entire portion of the dorsal margin included between it and the basal streak is white. Frequently also the second fascia does not quite attain the costal margin, and when it does, it is sometimes interrupted near the costa. Many of these specimens I should have considered as distinct species if I had not bred them from identical mines on the upper side of the leaves of Sugar Maples (*Acer Saccharinum*). So in a collection of several leaves scarcely any two larvæ will be found alike, the general shade of colour and the distinctness of the maculæ and translucent spots varying with each moult, and finally, when just ready to become pupæ, no traces of either maculæ or translucent spots are visible. *Alar. ex.* ¼ inch. Common in Kentucky, Wisconsin, and Pennsylvania.

ERRATA.—*Ante* p. 84, line 5 from bottom, for *thinner*, read *thence;* pp. 111 & 112, for *Ostryarella*, read *Ostryæella;* for *Corylisella*, read *Coryliella.*

NOTES ON THE LARVA OF PRIOCYCLA ARMATARIA *Herr. Sch.*

BY W. SAUNDERS, LONDON, ONT.

Specimens of a nearly black geometric larva which afterwards proved to belong to this species, were taken last year on the 15th of July on currant and gooseberry bushes, on which they were feeding. They fed on the foliage of the black currant as well as of the red, and in fact seemed to prefer it.

When first taken they answered to the following description:

Length .45 in. Body tapering a little anteriorly, thicker on middle and hind segments.

Head small, bilobed, brownish black spotted with white, a streak of white in the upper part of each lobe, a patch of the same color across the middle, produced to a point in the centre, a smaller patch of the same just

above mandibles, and besides these several small scattered whitish dots. Mandibles tipped with brown, palpi pale whitish.

Body above dark brown nearly black, dotted and streaked with bright pale yellow. On each segment from fourth to terminal, is a whitish dorsal crescent composed of whitish dots and streaks, most striking on 5th, 6th, and 7th segments, on the others, pale and less distinct. The 5th, 6th, 7th, and 8th segments are enlarged at the sides and projecting, while the spaces between segments are unaltered; the 6th and 7th segments bulge out more than the others. On the sides of 8th, 9th, and 10th segments is a patch of bright yellow. There is also a subdorsal row of raised dots, those on the anterior and middle segments dark brown, while those on the posterior segments are tipped with yellow. The terminal segment has a fleshy hump or prominence composed of two round tubercles with a patch of yellow on the outside of each. A few short brownish hairs are scattered over the surface of the body.

The under surface is blackish brown, feet and prolegs of a similar hue, the anterior pair of prolegs has a stripe of yellow on the outside.

Before maturing, this larva attained a length of ¾ths of an inch or more, but retained the same markings excepting on the head, which became pale brown, dotted with black.

The larva entered the chrysalis state early in the fall. It constructed a slight web composed of silk interwoven with portions of leaf and frass, and stretched across a corner of the wooden box in which it was confined, and within this the change was effected.

One specimen produced the imago on the 1st of June following; the other on the 8th of the same month.

The accompanying figure (30) represents the moth, which is a little below the average size. The color of its wings is yellowish brown shaded with purplish, especially on the hind wings; the streaks and dots are of a deeper shade of brown. The under surface is of a deep yellow dotted with reddish brown and with a line of the same color crossing the wings a little beyond the middle. Behind this line on the posterior wings the color becomes pale purplish brown.

FIG. 30.

While this insect may be ranked among those that are injurious to the fruit grower, inasmuch as it is destructive to the gooseberry and currant, still it is comparatively rare, and has not, thus far, at any time presented itself in such numbers as to attract the attention of those interested in this department of industry.

ANNUAL GENERAL MEETING

OF THE

ENTOMOLOGICAL SOCIETY OF ONTARIO.

The Annual General Meeting of the Society was held at Queen's College, Kingston, Ont., on Wednesday evening, September 27, 1871.

The President, Rev. C. J. S. Bethune, being unavoidably detained, the Vice-President, Mr. W. Saunders, of London, Ont., took the chair.

The Secretary-Treasurer then read the following Financial Statement for the year ending September 23, 1871.

RECEIPTS.

By Balance from 1870			$34 97
" Members' Fees—Arrears Members	$12 00		
" " " " Branches	10 00		
" " " 1871 Members	75 00		
" " " " Branches	15 00		
		112 00	
" Sale of Cork		10 69	
" " Pins		44 83	
" Grant from Bureau of Agriculture		500 00	
" List and Labels		0 45	
" Sale of Back Nos. of CAN. ENT.		16 07	
" Donation		1 00	
" Various small accounts		10 30	
" Exchange of Am. and Eng. Cy		4 59	

EXPENDITURE.

To Expense acct	$77 92		
" Engraving	27 25		
" CANADIAN ENTOMOLOGIST, Printing Nos. 10, 11, 12, Vol. II., and Nos. 1—6, Vol. III	330 91		
" Pins	11 80		
" Library account	41 95		
" Balance in Bank of Montreal	233 73		
" Various small accounts	11 34		
	$734 90	$734 90	

We certify that the above is a correct statement of accounts for the

year ending Sept. 23, 1871, as shewn by the Treasurer's Books with vouchers for all disbursements.

JOHN H. GRIFFITHS. | Auditors.
CHAS. CHAPMAN. |

London, Sept. 23, 1871.

The Treasurer stated that the balance now in hand would be entirely spent this year in completing the remaining six Nos. of the CAN. ENT., which the Editor purposed to do before Christmas.

After December it is intended that the numbers should be issued monthly, but at present it is necessary to issue double numbers in order to complete the current volume during the year.

The Secretary also stated that in accordance with their statute of incorporation, an annual report of insects injurious to the farm and garden would be furnished to the Commissioner of Agriculture, and that a printed copy thereof would be forwarded to each member of the Society.

The following officers were then elected for the ensuing year:—

PRESIDENT.—Rev. C. J. S. Bethune, M. A., Trinity College School, Port Hope.

VICE-PRESIDENT.—W. Saunders, Esq., London, Ont.

SEC.-TREAS.—E. B. Reed, Esq., " "

COUNCIL.—Prof. Croft, Toronto; Prof. J. Macoun, Belleville; R. V. Rogers, Esq., Kingston; J. M. Denton, Esq., London; J. Pettit, Esq., Grimsby.

AUDITORS.—John H. Griffiths, London; Chas. Chapman, London.

The President's Annual Address will be found on another page.

Prof. Dupuis, of Kingston, laid some information before the meeting with regard to Lithographs for the CAN. ENT. Several members of the Kingston Branch expressed their pleasure at the meeting being held in their city, and from the spirit evinced by their remarks it is evident that Entomology will not be allowed to languish, but that some good work may be expected from the "Limestone City."

Before adjourning, the Secretary took occasion to reciprocate the kindly sentiments that the President of the Fruit Growers' Association had so courteously expressed in his Annual Address the night previous with regard to the Entomological Society of Ontario. It is sincerely to be hoped that the two sister Societies may long continue to work together in such harmony, and that the results of their respective labours may be felt and appreciated by the country at large.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 116.)

[95.] 133. CREOPHILUS VILLOSUS *Grav.*—Length of body, 7 lines. Taken in Lat. 54° in Canada, also by Dr. Bigsby, and in Nova Scotia by Capt. Hall. I have specimens likewise, taken in Britain. [Quite common throughout Ontario.]

This species is extremely similar to *C. maxillosus*, and its American representative. The following circumstances principally distinguish them. The anterior angles of the prothorax in *C. maxillosus* are *thinly* cloathed with shortish *black* hairs; in *C. villosus*, these hairs are *cinereous*, longer, more numerous, and cover a larger portion of the angle; in the former, the band of the elytra is whiter and wider than in the latter: in the former also the back of the abdomen, especially the third and fourth segments, is mottled with cinereous hairs; in the latter the second and third have each a cinereous band interrupted in the middle: again the *four* first ventral segments in *C. maxillosus* are thickly covered with decumbent cinereous hairs, with each a lateral black spot on both sides, while in *C. villosus* only the *three* first segments are so distinguished; and finally, in the former the sides of the postpectus are covered with black hairs, and in the latter with cinereous.

[FAMILY SILPHIDÆ.]

[96.] 134. NECROPHORUS VELUTINUS *Fabr.*—Length of body, 8 lines. Taken in Nova Scotia by Dr. MacCulloch. [Common in Ontario.]

Body black; nose separated posteriorly from the front by a straight line, anteriorly furnished with a submembranous rhinarium, above which is a round flattened tubercle; knob of the antennæ black: prothorax dilated anteriorly, thickly covered with golden pile: elytra with two orange-coloured bands, toothed as it were on both sides, the anterior being the widest; epipleura pale yellow: postpectus covered with golden pile: posterior trochanters truncated at the apex and emarginate.

135. NECROPHORUS HEBES *Kirby.*—Length of body, 7 lines. Taken in Nova Scotia by Capt. Hall.

[97.] Like the last, but the nose is separated from the front by a

curved line, it is also marked on each side by a deep longitudinal furrow, and is depressed longitudinally in the centre; but what more strongly characterizes it, is the want of the rhinarium or nostril-piece discoverable in most of the other species: the anterior part of the prothorax is less conspicuously dilated and naked: the elytra anteriorly have a strongly toothed orange band including a black dot at the suture; posteriorly they have a large toothed spot of the same colour; the epipleura is orange in the middle, black at the tip with a black spot at the base connected with the black disk: postpectus not brilliant with golden pile. [Unknown to Dr. LeConte.]

136. NECROPHORUS OBSCURUS *Kirby*.—Length of body 9—10 lines. A pair taken in the journey from New York to Cumberland-house.

Body black. Nose separated from the front by a straight abbreviated line, with a deep oblique furrow on each side and no distinct rhinarium; three last joints of the knob of the antennæ ferruginous: prothorax anteriorly dilated: elytra with two rather obscure deep red bands, the anterior one broad, dentated and reaching from the epipleura to the suture: the posterior one externally broad, internally narrow, and reaching neither epipleura nor suture; epipleura deep red, narrower than usual: posterior trochanter emarginate. [Taken in Canada; at Toronto by Mr. Couper, and at Grimsby by Mr. Pettit.]

137. NECROPHORUS MELSHEIMERI *Kirby*.—Length of body 9 lines. A single specimen taken in the journey from New York to Cumberland-house.

[98.] Body black. Nose separated from the front by an obtusangular line; rhinarium orange-coloured, subtrapezoidal; three last joints of the knob of the antennæ ferruginous: prothorax dilated anteriorly: elytra with two orange-coloured subundulated toothed bands reaching from the epipleura to the suture; epipleura broad, orange-coloured: posterior trochanters truncated at the apex with the external angle recurved; tibiæ dilated, especially the anterior part, or cubits: postpectus on each side covered with tawny hairs. [Taken at Toronto by Mr. Couper.]

138. NECROPHORUS HALLII *Kirby*.—Length of body 8-9 lines. Taken in Nova Scotia by Capt. Hall, and in Massachusetts by Mr. Drake.

Body, as usual, black. Nose separated from the front by a straight line, channelled; rhinarium distinct, membranous, tawny, anterior angles elongated; knob of the antennæ with the three last joints dull-orange: prothorax nearly circular, anteriorly emarginate: elytra with an anterior

angular band which does not reach the suture, and a posterior crescent or kidney-shaped spot, both of a deep orange; epipleura black; wings dusky: trochanters emarginate at the tip.

139. NECROPHORUS PYGMÆUS *Kirby*.—Plate ii., Fig. 3.—Length of body 6 lines. A single specimen taken in the Rocky Mountains. [Taken at Grimsby, Ont., by Mr. Pettit; north shore of Lake Superior (Agassiz).]

[99.] This is the smallest known species of the genus. Nose separated by a nearly straight line from the front; rhinarium transverse, not membranous; knob of the antennæ black: prothorax nearly circular, there is a slight sinus on each side, and a deeper anterior one: elytra with an anterior angular band dilated at the epipleura, and a nearly semicircular spot at the apex of a dull deep red; epipleura of the same colour but black at the apex, and with a black spot at the base: posterior trochanters emarginate at the tip.

140. NECRODES [SILPHA] SURINAMENSIS *Fabr.*—Taken in Nova Scotia by Dr. MacCulloch. [Abundant on carrion in all parts of Canada.]

[100.] 141. OICEOPTOMA [SILPHA] MARGINALE *Fabr.*—Length of body 6 lines. Several specimens taken in Lat 54°, taken also by Dr. MacCulloch in Nova Scotia.

Body oblong, black, very thickly punctured. Head with an oblong punctiform impression in the space between the eyes: the margins of the prothorax, the lateral more widely, are of a pale-red: the whole disk is covered by a large three-lobed black spot, with the lateral lobes the smallest and shortest: the elytra are reddish-brown with three longitudinal ridges, the external one, as usual, stopping short of the apex. In the female the elytra at the apex are subsinuated and subacuminated. [Very common throughout Canada.]

142. OICEOPTOMA [SILPHA] LAPPONICUM *Linn.*—[101.] Taken abundantly both in the journey from New York to Cumberland-house, in Lat. 65°, and in Canada by Dr. Bigsby. This species abounds in the huts of the Laplanders, devouring every thing—skins, flesh, and dried fish. [Very common throughout Canada. For description *vide* Say's Ent. Works ii., 122, who described it as a new species under the name of *S. candata*.]

143. OICEPTOMA [SILPHA] TRITUBERCALATUM *Kirby*.—Length of body 4¼ lines. Several specimens taken in the journey from New York to Cumberland-house, and in Lat. 54°.

[102.] This species appears to be the American representative of *Silpha opaca*, from which it differs in being smaller, and proportionally

narrower; the prothorax is longer in proportion to its width, and has an obsolete channel: the elytra are more distinctly punctured, and besides the ordinary elevation at the termination of the external ridge, have two smaller ones at that of the other two ridges; the ridge next the suture also is more elevated at its termination than in *S. opaca*, of which in every other respect it is the exact counterpart. The elytra of the female are slightly sinuated at the apex, and obtusely acuminate. Variety B. Quite black.

144. OICEOPTOMA [SILPHA] INEQUALE *Fabr.*- Length of body 5¼ 6 lines. Same localities as the preceding.

Body black, not at all glossy, minutely punctured; punctures not visible except under a good lens. Three last joints of the antennæ cinereous: prothorax anteriorly emarginate with four discoidal obtuse ridges, the lateral ones undulated and oblique and the intermediate ones straight and parallel: elytra with the three customary longitudinal ridges, the outermost the shortest and most elevated, and the intermediate one towards the apex curving inwards; in the female the apex of the elytra is subacuminate and very acute, but with scarcely any sinus; in the male it is rounded. [Quite common in Canada.]

MISCELLANEOUS NOTES.

ACORN WEEVILS.—I see that in the last CANADIAN ENTOMOLOGIST, Mr. J. Pettit refers the Acorn Weevil to *Balaninus nasicus* Say. It is true that Say's descriptions are so brief that, not knowing how many specimens he described from, it is difficult to fully recognize his species, and Dr. Horn may, in this sense, be quite right in stating that the acorn-feeding species cannot be referred to any that are described. Yet the species I have bred must evidently be referred to Say's *rectus*, which is easily distinguished from *nasicus* by the finer, more rectilinear rostrum. If Mr. Pettit has specimens of *nasicus*, I think he will have no difficulty in distinguishing the two species, and I shall be greatly obliged if he will send me a few of his acorn-bred specimens.

In what I take to be *nasicus*, the rostrum is on an average darker, thicker more curved, shorter, and with the antennæ springing from its middle in the ♂ and from its basal third in the ♀. Two thoracic paler vittæ are observable on the thorax, and there is always a pale transverse band be-

hind the middle of the elytra and a sutural vitta. In the ♂ the rostrum is equal to three-fourths the length of the body; in the ♀ it is equal to five-fourths. I believe it breeds entirely in hickory nuts.

What I take to be *rectus*, on the contrary, has a finer, lighter-coloured rostrum which is much more rectilinear, especially in the ♀; and it always differs from *nasicus* in having no bands or *vittæ*, the elytra being uniformly spotted as in *sparsus* Schœn. This is the species I breed from acorns, and I believe it also infests hazel-nuts.

There are several other species which closely resemble these two and seem to connect them, and I am satisfied that we can do very little in classifying them until their habits and variations are better understood.—

C. V. RILEY.

A PHENOMENON.—The Ashy Blister Beetle, *Lytta cinerea* Fab. (*Macrobasis Fabricii* LeConte) was very destructive to the potato vines in several parts of the Province of Quebec during last July. In some places it was exceedingly abundant, and attacked the Windsor bean as well as the potato. Five years ago it was also very common. Its appearance this year gave occasion to an article in one of the French newspapers published in Three Rivers, which is such a wonderful production that it is well worthy of being placed on record. Entomologists will have a smile at it, and think that a little better acquaintance with insect life would do our farmers and journalists no harm. The following is a free translation of the article:

"A NEW PLAGUE.

"We are threatened, it would seem, by a new plague. A citizen, a good observer, reports to us that he has noticed the following phenomenon in a fine field of potatoes on his grounds in this town. He tells us that he has found on his potatoes a large quantity of blue beasts (winged, and the colour of blue stone), which rapidly devoured all the leaves of the plants, leaving only the bare stems. He gathered more than a quart of these insects. After some time, the insect undergoes a change. It dries in the sun, an opening appears beside the shoulders, near the neck, and a very active fly emerges, at first of a blue colour, which alights on the cabbages, and doubtless continues its ravages there. As it grows older, this fly becomes grass-coloured, probably on account of feeding on the cabbage leaves. This subject is a most important one, and merits the close attention of our agriculturists."

What can the "active fly" be, which makes its appearance in such an

extraordinary manner, issuing (as the Abbe Provancher well expresses it), like Minerva from the brain of Jupiter? The mystery will probably remain forever unsolved. The only solution that can be offered is, that as the "good observer" has mixed things so promiscuously, he may have mistaken the larva of *Pieris rapæ* for a fly, and fathered (or mothered) it on the unfortunate Blistering Beetle, which has enough to do in attending to the potatoes, without providing for the cabbage also.

This beetle seems to be the most injurious of the insects infesting the potato crop in Lower Canada, and its attacks cease about the beginning of August, when the insect is supposed to enter the earth to deposit its eggs. Cutworms, however, did some harm last spring by nipping off the young shoots; and a larva (perhaps of the same family), destroyed the seed in some places, by eating it in the ground, as I was informed by a farmer in the vicinity of Quebec. —G. J. Bowles, Quebec.

Butterfly Pictures!—In the woods, near Stamford Bridge, *Argc Galathea* formerly abounded, but it has not been seen for some years; indeed, several of our most conspicuous butterflies (notably *Io*, *Paphia*, *Rhamni*, and *Galathea*), have lately become rare, or disappeared from the neighbourhood of York, Leeds and Sheffield, and this not from any "improvement" of the land, or, so far as appears, any alteration of the former conditions of their existence, but simply from their merciless pursuit and wholesale slaughter by the makers of butterfly pictures. The numbers thus annually destroyed are almost incredible. I have known 250 peacocks used in the construction of an elephant, and upwards of 500 *Vanessa Urticæ* in the figure of a crocodile 3 feet long! *Galathea* was an especial favourite with the tribe; a portrait of Lord Brougham in butterflies, the checked trousers depicted by *Galathea's* wings, is considered a very clever work of art! —E. Birchall, in *Newman's Entomologist.*

Grasshoppers.—Under the pressure of necessity, a Salt Lake City blacksmith has invented a machine to kill grasshoppers. It can be manufactured for $75. It consists of a frame drawn by two horses, having an apron extending forward close to the ground to scrape up the locusts, with a hood above it, forming a box open in front. At the rear of the machine is a pair of rollers geared together, the upper one driven by the carrying wheels, of which it forms the axle. Whatever may find its way into the front of the machine is obliged to pass between the rollers at the back, which, being capable of being forced close together, are described as completely demoralizing the "ironclads."—*Times.*

EXCHANGES, &c.

The undersigned would be pleased to open communications with any Entomologist in Canada, United States or England with a view to exchanging specimens. Address JAMES COLWELL, care of A. CHOUN, Kingston, Ont.

THE undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address EDW. L. GRAEF, 40 Court St., Brooklyn, N. Y., U. S.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera. would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston. Mass.

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UNITED STATES. The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

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NOTES ON SOME INSECTS OF NOVA SCOTIA AND CANADA.

BY FRANCIS WALKER, F. L. S., LONDON, ENGLAND.

The following communication is introductory to a few remarks on the Nova Scotian and Canadian Insects which I have received through the kindness of J. M. Jones, Esq., W. Saunders, Esq., and Prof. Croft.

The study of the geographical distribution of Insects has become more interesting by the difference of opinion as to the origin and diffusion of species. The insects of separate arctic regions have a great mutual resemblance, and the difference between them increases in the successive concentric circles from the above regions towards the equator. It has been said that the advance of the glacial period was accompanied by the migration of insects southward, and that the present distribution of insects was effected by the prevalance of this epoch and by the succeeding temperate epoch. During the diminution of the glacial, the arctic species of the present time migrated northward or ascended the mountains, and thus caused the partial identity of the insects of the Alps with those of the North. The similarity of insects of widely separated regions, such as North Europe, North America, and North-east Asia, chiefly consists in the arctic or northern forms; the difference between them is found in the species that have advanced northward in later times. Some species inhabit both the South and the North, and occur in Hindostan as well as in North Europe, but the rest appear either to have wholly continued in the South, or to have wholly migrated thence to the North. The insect-fauna of North America appears in two aspects—the northern aspect, which closely and in some cases wholly resembles that of North Europe; and the southern aspect, which is very different from that of North Europe, and consists of species that have migrated from the South as far as Canada.

The Diptera in the following list are natives of Nova Scotia, and those marked thus * also inhabit Europe.

MYCETOPHILIDÆ.

MYCETOPHILA propinqua, *Walk.*
contigua, *Walk.*
læta, *Walk.*
SCIARA præcipua, *Walk.*

CULICIDÆ.

CULEX stimulans, *Walk.*
provocans, *Walk.*

CHIRONOMIDÆ.

CHIRONOMUS unicolor, *Walk.*

TIPULIDÆ.

PEDICIA albivitta, *Walk.*
contermina, *Walk.*
LIMNOBIA Argus, *Say.*
badia, *Walk.*
TIPULA triplex, *Walk.*
duplex, *Walk.*
flavicans, *Fabr.*
borealis, *Walk.*
maculipennis, *Say.*
resurgens, *Walk.*
frigida, *Walk.*
alterna, *Walk.*
BITTACOMORPHA clavipes, *Fabr.*
TRICHOCERA bimacula, *Walk.*

BIBIONIDÆ.

PENTHETRIA atra, *Macq.*
BIBIO xanthopus, *Wied.*
humeralis, *Walk.*
scita, *Walk.*
vestita, *Walk.*
gracilis, *Walker.*

STRATIOMIDÆ.

STRATIOMYS norma, *Wied.*
ODONTOMYIA intermedia, *Wied.*
vertebrata, *Say.*
CHRYSOMYIA viridis, *Say.*

TABANIDÆ.

TABANUS calens, *Linn.*
flavipes? *Wied.*
affinis, *Kirby* (frontalis, *Walk*).
inscitus, *Walk* (bis lectum)
comes, *Walk.*
gracilis, *Wied.*
marginalis, *Fabr.*
simulans, *Walk.*
CHRYSOPS vittatus, *Wied.*
mœrens, *Walk.*
carbonarius, *Walk.*

ASILIDÆ.

LAPHRIA posticata, *Say.*
thoracica, *Fabr.*
sericea, *Say.*
sacrator, *Walk.*
Æatus, *Walk.*
DASYPOGON sexfasciatus, *Say.*
argenteus, *Say.*
Falto, *Walk.*
Lutatius, *Walk.*
ASILUS apicalis, *Wied.*
Lecythus, *Walk.*
Sadyates = Abilux, *Walk.*

LEPTIDÆ.

LEPTIS mystacea, *Macq.*
CHRYSOPILA quadrata, *Say.*
fumipennis, *Say.*
proxima, *Walk.*
reflexa, *Walk.*

BOMBYLIDÆ.

THEREVA vicina, *Walk.*
conspicua, *Walk.*
senex, *Walk.*
ANTHRAX tegminipennis, *Say.*
Œdipus, *Fabr.*
fascipennis, *Say.*

ANTHRAX fulviana, *Say.*
Bastardi, *Macq.*
lateralis, *Say.*
vestita, *Walk.*
BOMBYLIUS pygmæus, *Fabr.*
*major, *Linn.*

EMPIDÆ.

EMPIS Ollius, *Walk.*
colonica, *Walk.*

SYRPHIDÆ.

SYRITTA proxima, *Say.*
XYLOTA ejuncida, *Say.*
Libo, *Walk.*
RHINGIA nasica, *Say.*
*HELOPHILUS pendulus, *Linn.*
Latro, *Barnston.*
MERODON curvipes, *Wied.*
morosus, *Walk.*
SERICOMYIA militaris, *Barnston.*
filia, *Walk.*
ERISTALIS nebulosus, *Barnston.*
transversus, *Wied.*
vinetorum, *Fabr.*
flavipes, *Barnston.*
lateralis, *Walk.*
*SYRPHUS Ribesii, *Linn.*
*MELITHRIPTUS Menthastri, *Linn.*
*hieroglyphicus, *Meig.*

DOLICHOPIDÆ.

PSILOPUS nigrofemoratus, *Mss.*
albicoxa.
MEDETORUS albiflorens, *Walk.*
DOLICHOPUS affinis, *Hal.*

CONOPIDÆ.

CONOPS sagittaria, *Say.*

MYOPIDÆ.

MYOPA vicaria, *Walk.*

OESTRIDÆ.

CUTEREBRA horripilum, *Wied.*
OESTRUS supplens, *Walk.*
*GASTRUS Equi, *Fabr.*
subjacens, *Walk.*

TACHINIDÆ.

GYMNOSOMA par, *Walk.*
occidua, *Walk.*
OCYPTERA Dosiades, *Walk.*
ECHINOMYIA hystrix, *Fabr.*
algens, *Wied.*
florum, *Barnston.*
finitima, *Walk.*
signifera, *Walk.*
decisa, *Walk.*
candens, *Walk.*
Anaxias, *Walk.*
iterans, *Walk.*
TACHINA Ampelus, *Walk.*
Pyste, *Walk.*
Panactius, *Walk.*
Mella, *Walk.*
Theutis, *Walk.*
prisca, *Walk.*
Pansa, *Walk.*
violenta, *Walk.*
irrequieta, *Walk.*
GONIA Philadelphica, *Macq.*

MUSCIDÆ.

DEXIA (Estheria Desv.) abdominalis, *Desv.*
(Estheria Desv.) tibialis, *Desv.*
Ogoa, *Walk.*
SARCOPHAGA plinthopyga, *Wied.*
*hæmorrhoidalis, *Fall.*
avida, *Walk.*
rabida, *Walk.*
acerba, *Walk.*
vigil, *Walk.*
MESEMBRINA Latreillii, *Desv.*
CALLIPHORA vicina, *Desv.*
*erythrocephala, *Meig.*
viridescens, *Desv.*
*LUCILIA cornicina, *Fabr.*
*illustris, *Meig.*

*Musca corvina, *Fabr.*
*vespillo, *Meig.*
*Aptoneura meditabunda, *Fabr.*
*stabulans, *Fall.*
Stomoxys ? Cybira, *Walk.*

ANTHOMYZIDÆ.

Anthomyia Apina, *Walk.*
Barpana, *Walk.*
Narina, *Walk.*
Luteva, *Walk.*
Bysia, *Walk.*
Troëne, *Walk.*
Emene, *Walk.*
Alcathoe, *Walk.*
Lysinoe, *Walk.*
Ausoba, *Walk.*
Anthomyia Signia, *Walk.*
Geldria, *Walk.*
Donuca, *Walk.*
Brixia, *Walk.*
Viana, *Walk.*
Isura, *Walk.*
Anthomyia determinata, *Walk.*
Opalia, *Walk.* leucostoma ? *Fall.*

HELOMYZIDÆ.

*Scatophaga stercoraria, *Linn.*
*squalida, *Merg.*
pubescens, *Barnston.*
intermedia, *Walk.*
*Celopa sciomyzina ? *Hal.*
Actora ferruginea, *Walk.*
Helomyza tincta, *Walk.*
*Heteromyza buccata, *Fall.*
Blepharipterа fasciata, *Walk.*
*Tetanocera elata, *Fabr.*
Dryomyza convergens, *Walk.*

LAUXANIDÆ.

*Lauxania cylindricornis, *Fabr.*
*Elisoe, *Wied.*
*lupulina, *Fabr.*
Palloptera Philadelphica, *Macq.*

GEOMYZIDÆ.

*Drosophila cellaris, *Linn.*

LIST OF LEPIDOPTERA TAKEN AT QUEBEC.

BY G. J. BOWLES.

On page 95 of Volume II. of the Canadian Entomologist, I gave a list of the Diurnal Lepidoptera so far taken at Quebec. I now add the Hererocera as far as the Bombycidæ, availing myself of the latest revision of the species by Dr. Packard and Mr. Grote. It is to be hoped that the researches of these eminent Entomologists have placed the nomenclature and grouping of these moths on a permanent basis.

SPHINGINA.—Sesiadæ.

1. *Sesia diffinis*, Boisduval. Rare. June.

2. *Hemorrhagia thysbe*, Fab. (*Sesia palasgus*, Cramer). Common in June.

3. *Hemorrhagia gracilis*, Grote & Rob. Described from a specimen captured by me in June, 1865 (Proc. E. S. Phil. V. 175). Its

habitat has been erroneously stated by them to be London, Ont., owing to their having received the moth from Mr. Saunders. (See page 10, Vol. I., CAN. ENT.) I have not met with the species since.

SPHINGIDÆ.

Amphion nessus, Cramer. Not uncommon. July.

Deilephila chamænerii, Harris. Very common some seasons, and appears in June, at the time the lilac is in bloom, of which it is very fond. A larva which, I think, produces this species, feeds on Fuschias, and on *Clarkia rosea*. I took four of them this year on the latter plant in my garden. They have changed to pupæ just below the surface of the ground. The caterpillars were of a dull olive green colour, with round cream-coloured spots in a row on each side, and a red caudal horn. Its native food-plant is unknown to me.*

Otus chærilus, Cramer. (*Darapsa chærilus*). Rare. June.

Sphinx chersis, Hubner. (*Sphinx cinerea*, Harris). Rare. June or July.

Sphinx Kalmiæ, Abbott & Smith. Not uncommon. June or July. I have taken the larva on lilac, also on *Fraxinus sambucifolia*.

Sphinx drupiferarum, Abbott & Smith. Not uncommon. June. Larva taken last year on plum.

Sphinx gordius, Cramer. Uncommon. June.

Daremma undulosa, Walker. Commonly known as *Ceratomia repentinus*, Clemens. Not uncommon. June or July. (See Vol. I., CAN. ENT., page 17).

Ceratomia amyntor, Hubner. (*Ceratomia quadricornis* Harris). For two or three years in succession I obtained the full grown larva of this species, on the 25th and 26th August, from Basswood trees near the Anglican Cathedral, Quebec, but have seen none for several seasons past. It appears in June, and may be considered rare.

Ellema Harrisii, Clemens. Uncommon. June or July.

Smerinthus modesta, Harris. Very rare.

Smerinthus excæcatus, Abbott & Smith. Not uncommon. June or July.

Smerinthus geminatus, Say. Not uncommon. June or July.

AEGERIADÆ.

Trochilium tipuliformis, Harris. Very common on red and black currant. July.

* The Editor mentions having captured this species at Sault Ste. Marie in middle of August. (Page 83 of this volume.)

I have three species of *Trochilium*, which are still unnamed.

No. 1 answers well to the description of the male of *T. exitiosa*, Say, but unless its larva lives in some other tree than the peach or cherry, it cannot be this insect, as these fruit trees are not cultivated in the Quebec region. This species is rare.

No. 2 may be the *Trochilium acerni* of Clemens, described in Morris' Synopsis, page 330. It is an uncommon insect. The "Northern States" is given as its habitat by Clemens.

No. 3. This Ægerian is perhaps the *Trochilium pyramidalis* of Walker (C. B. M., VIII. 40) described on page 331 of Morris' Synopsis, though the locality given there is far north of Quebec. It is a rare species.

Thyris maculata, Harris. Very rare. June.

ZYGÆNIDÆ.

Alypia Langtonii, Couper. Taken by him and described in the CANADIAN NATURALIST for 1865, page 64. Not uncommon.

Eudryas grata, Fab. This moth is abundant some seasons. In 1868 I saw them in large numbers on *hops*, in a small garden. No grape-vines were in the vicinity. This year I found numerous larvæ on wild grape vines.

Ctenucha virginica, Charpentier. Common.

Lycomorpha pholus, Drury. *(Glaucopis pholus).* Not common. I have only taken it in one locality—a rocky ridge where lichens grow plentifully, about five miles from the city.

Note.—This arrangement of the *Zygænidæ* is in accordance with Packard's "Notes on the Zygænidæ" in Proc. Essex Ins., 1864.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 130.

LITHOCOLLETIS.

23.—*L. Cincinnatiella. N. sp.*

Face, palpi, under surface and legs silvery-white, the legs marked on their anterior surface with golden and brownish spots and bands: tuft, white, golden at the sides; antennæ silvery-white beneath, above golden brown faintly annulate with whitish: thorax and anterior wings bright

golden; upon the wings is a short snow-white median basal streak strongly dark-margined behind and within. (Sometimes the anterior margin and sides of the thorax are also white). Two snow-white fasciæ, one at about the basal ¼th, the other about the middle, both strongly dark-margined behind, and sometimes slightly so interiorly; and both strongly angulated posteriorly near the costa; with the first sometimes slightly interrupted at the angle, and the dark margin of the second posteriorly produced. A long oblique snow-white dorsal streak at the base of the dorsal ciliæ posteriorly dark-margined, and a smaller costal one a little behind it at the base of the costal ciliæ, similarly dark-margined. This dorsal streak is sometimes posteriorly produced, and confluent with a straight dorso-apical streak, which is faintly dark-margined behind, but is sometimes entirely wanting. When present it forms the interior border to the apical dusting. Sometimes the costal streak is produced so as to be confluent with it also, and opposite to it there is sometimes a costo-apical white spot which is separated from it by the apical dusting, which extends thence to the apex and is black upon a white ground. Hinder marginal line in the ciliæ dark brown. Ciliæ golden. *Al. ex.* ¼ to ⅓ inch. Kentucky. Wisconsin. One of the commonest and prettiest species. The larva mines the leaves of White Oaks. (*Quercus Alba* and *Q. obtusiloba*), and sometimes there are several mines on the same leaf. It mines the upper surface. There are always several larvæ in a mine, and this is the species of which (as stated *ante* p 55) I have counted fifteen small larvæ in a single small mine. The mine is *brownish-yellow* and spreads frequently over a large part of the leaf, and may thus be distinguished from the *whitish* mine of *L. hamadryadella* which sometimes is found upon the same leaf with it. The young larvæ lie packed together side by side in the mine in a curve or crescent, and the mine for some distance shows a series of concentric curves gradually enlarging as the larvæ grow. The frass is scattered. The older larvæ scatter, and usually most of them leave the mine and perish. It is much preyed upon by spiders, which, I believe, from various circumstances (though I have not caught them *flagrante delicto*), tear open the mines and eat the larvæ. The same thing happens to various other species of larvæ. The mines of this and many other species are also much infested by a black species of Thrips. What its business in them is, I have not ascertained. Various mites are also found in them. This species passes the winter in the larval condition and forms its pupa in a flat thin cocoon or web in the mine, becoming a pupa in April, and the imago emerging in about ten

days. The larva is flat, whitish; head and sides of the first segment yellowish. Maculæ very indistinct and pale yellowish. All of the larvæ that I have examined this summer were of this character except in one mine, where with several flat larvæ there was one *dead cylindrical* one. My recollection, however, is very distinct that the first mine that I opened and which was gathered in March from a tree on which it had hung all the winter, contained two pupæ and four *cylindrical* larvæ, and the description in my notes made at the the time confirms my recollection. These four larvæ became pupæ, and I have now by me the imagines which I bred from them, and I can not conceive how my eyes could have deceived me so as to mistake a flat larva for a cylindrical one. Yet I am loath to believe that there are two larval forms in the species, although it is well known that there are two in the genus.

† † *Without fasciæ, but with dorsal and costal streaks.*

24.—*L. Argentinotella* Clem. *Loc. cit. sup.*, p. 325.

Dr. Clemens describes the imago of this handsome species, but says that he can give no account of its larva, or food plant. I have bred it from a tent mine on the under side of Elm leaves (*Ulmus Americana*). The larva is cylindrical and yellowish.

All of my specimens have the white line on the anterior margin of the thorax extended back over the tegulæ, and confluent with the basal streak. Dr. Clemens does not mention these markings of the thorax, but they are so variable in many species—sometimes present, sometimes absent—that I have no doubt of the identity of my specimens with that described by Dr. Clemens, as they agree in all other respects, and I have never met with any species which might be mistaken for it. *Alar. ex* ¼ *in.* Kentucky and Pennsylvania. Common.

25.—*L. basistrigella* Clem. *Loc. cit. sup.*, p. 321.

There is some variation in the disposition of the apical dusting, and sometimes it is nearly wanting, and frequently the first dorsal streak does not quite attain the dorsal margin and is not produced to the base of the wing. *Alar. ex.* ¼ to nearly ⅓ in. The larva is cylindrical and makes a tent mine between two veins on the under side of the leaves of White and Chestnut Oaks (*Q. alba* and *bicolor* and *prinoides*). Common. Kentucky and Pennsylvania.

26.—*L. Ulmella. N. sp.*

Face and palpi silvery-white, tuft white intermixed with golden. Antennæ silvery-white, the apical two-thirds annulate with brownish.

Legs and under surface silvery-white. Anterior wings bright golden, inclining to orange, with a white streak along the dorsal margin from the base to the ciliæ, where it is deflexed and passes on to the dusted portion of the apex which is near the posterior margin, and is dark brown on a white ground. There are three small costal silvery streaks, the first and second being near the middle of the costal margin, and the second one the largest, while the third is small and near the apex. There is some variation in the size of the third costal streak and in the extent of the apical dusting, and sometimes the costal streaks are faintly dark-margined. The abdomen and legs are very pale-golden varied with white. *Alar. ex.* ¼ to nearly ⅓ in. Two specimens, taken at Columbus, Georgia, were so much larger than my Kentucky specimens that I was inclined to regard them as specifically distinct, but they were so much injured before I had an opportunity to compare them with my Kentucky specimens, that I can not be certain; the smaller specimens (♂?) are more distinctly marked than the larger. The larva is flat and makes an irregular blotch-mine, with scattered frass, in the upper surface of the leaves of *Ulmus Americana*. It resembles closely the larva of *L. Cincinnatiella*, but it is more greenish, whilst the imago resembles *L. basistrigella* somewhat, which has a cylindrical larva.

HINTS TO FRUIT GROWERS.

PAPER NO. 4.

BY W. SAUNDERS, LONDON, ONT.

ATTACUS CECROPIA.—During the winter months, when the apple trees are leafless, the large cocoons of the *Cecropia* moth may be found here and there, firmly bound to the twigs, and occasionally I have seen them on young trees attached to the stock near the ground. They are about

FIG. 31.

three inches long, pod-shaped (see fig. 31), and of a dirty brown colour,

and are entirely constructed of silk, the fibres of which are very much stronger than those of the common silk worm *Bombyx mori*. This silk has been worked to a limited extent and manufactured into socks and other articles, which have been found very durable; but a drawback to the advancement of this branch of industry lies in the fact that the caterpillars do not bear confinement well, and hence are not easily reared.

The exterior structure of the cocoon is very close and papery-like, but on cutting through this, we find the interior—surrounding the dark brown chrysalis—made up of loose fibres of strong yellow silk. This snug enclosure effectually protects the insect in its dormant state from the extremes of weather during the long wintry months. When the time approaches for the escape of the moth, which is about the beginning of June, the internal dark brown chrysalis is ruptured by the struggles of the occupant, and the newly born moth begins to work its way out of the cocoon. As it is possessed of no cutting instrument of any kind, this would indeed be a hopeless task had not the all-wise Creator made a special provision for this purpose, and to this end a fluid adapted for softening the fibres is furnished just at this juncture and secreted from about the mouth. On listening to the creature as it works its way through, you hear a scraping, tearing sound, which is made by the insect working with the claws on its fore-feet, tearing away the softened fibres and packing them on each side to make a channel for its escape. The place of exit is the smaller end of the cocoon, which is more loosely made than any other part and through which, after the internal obstacles are overcome, the passage is effected without much further trouble.

I have frequently watched their escape. First through the opening is thrust the anterior pair of bushy looking legs, the sharp claws of which fasten on the outside structure; then with an effort the head is drawn forward, suddenly displaying the beautiful feather-like antennæ; next, the thorax, on which is borne the other two pairs of legs, is liberated, and finally, the escape is completed by the withdrawal of the abdomen, through the orifice thus made. Queer looking creatures they are when they first put in an appearance, with their large, fat, juicy bodies, and tiny wings. When the wings are fully expanded they measure from five to six inches or more across, but when fresh from the chrysalis they are but very little larger than the wings of a bumble bee. The first necessity now for the welfare of the individual is to find a suitable location where the wings may be held in a good position for expanding, for without such favorable

Fig. 32. ATTACUS CECROPIA—*Male.*

circumstance they would never attain a serviceable size. It is necessary that a position should be secured where the wings may hang down as they are expanding, for which purpose the under side of a twig is often selected; and here, securely suspended by the claws, the wings undergo in a short time the most marvellous growth it is possible to imagine. The whole process, from the time of the escape of the moth to its full maturity, seldom occupies more than from half an hour to an hour, and during this time the wings grow from the diminutive size already mentioned to their full measure and capacity.

A wing clipped from the insect immediately after its escape, and examined under the microscope, reveals the fact that the thousands and tens of thousands of scales with which the wings are covered, and which afterwards assume such beautiful feather-like forms, are now nearly all threadlike, not folded up or wrinkled, but undeveloped. Impressed with this thought, the mind is fairly astonished at the almost incredible change wrought in so limited a time, for the growth embraces not only the extension of the surface of the wing, but the enlargement and maturity of every scale or feather on it, the individuals of which are but as dust to the naked eye. What a wonderful and intricate system of circulation and power of nutrition must be possessed to accomplish this marvellous result!

As some of our readers may not be familiar with the appearance of this our largest moth, we append a figure of it. (See fig. 32). Soon after their exit these moths seek their mates, and after pairing, the female begins to deposit her eggs, a process which occupies some time, for the eggs are not laid in patches or groups, but singly; and are firmly fastened with a glutinous material to the under side of a leaf; and as it is seldom there are more than one or two laid on any single tree or bush, a considerable distance must be traversed by the parent in the transaction of this all-important business.

Until the present season, I never had an opportunity of fairly computing the number of eggs which one of these moths will lay, and had roughly estimated them in my own mind at from 50 to 100. About the first of June, a pair of *cecropias* came into my possession, and afforded a favourable opportunity of throwing light on this point. On the 3rd of June, the female began to deposit eggs, which she continued to do at intervals until the 6th, and in a few days afterwards, died. On counting the eggs I found them to number 217. When we consider the relative size —for they are large—it may readily be imagined, that the size of the body of the moth, was much reduced upon the completion of her task. The

egg is about one-tenth of an inch long, nearly round, and of a dull creamy white colour, with a reddish spot or streak near the centre. The exact duration of the egg stage was not noted, but may be set down as probably from a week to ten days.

At the expiration of this period, the larva eats its way out of the egg, the empty shell of which furnishes the young thing with its first meal. At first it is black, with little shining black knobs on its body, from which arise hairs of the same colour. Being furnished with a superior appetite, its growth is very rapid; and from time to time its exterior coat or skin becomes too tight for its comfort, when it is ruptured, and thrown off. At each of these changes or moultings the caterpillar appears in an altered garb, gradually becoming more like the full-grown larva represented in the accompanying figure. (See fig 33.) It is very handsome. Its body is

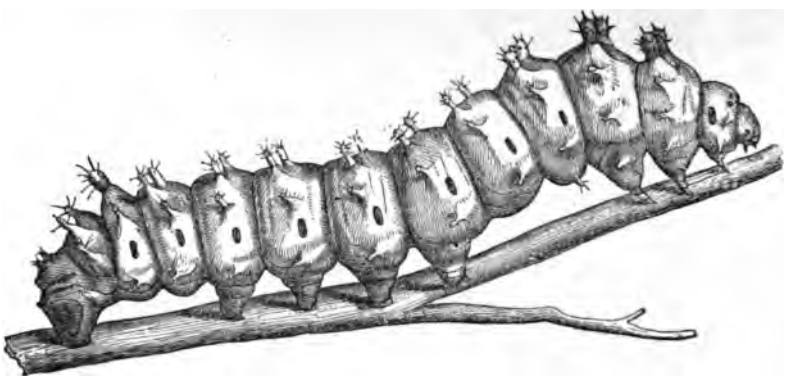

FIG 33.

pale green, the large warts or tubercles on the top of the 3rd and 4th segments are coral red, the remainder are yellow excepting those on the second and terminal segments, which, in common with the smaller tubercles along the sides, are blue. During its growth from the diminutive creature as it escapes from the egg, to the monstrous-looking full grown specimen, it consumes an immense amount of vegetable food; and especially as it approaches maturity, is this voracious appetite apparent. Where one or two have been placed on a young apple tree, they will often strip it entirely bare before they have done with it, and thus prevent the proper ripening of the wood, entailing damage to the tree and sometimes endangering its life; hence, during their season, they should be watched for and destroyed. Now that their period of active labor is over, their

cocoons may be looked for, and removed in time to check their further increase. In the caterpillar state they are not of dainty appetite, and, while partial to the apple, will eat other foliage as well; were it not so, we should soon hear more of their destructive effects. We have taken them feeding on cherry, plum, maple, willow, lilac, black and red currant, and hazel, and they are said to attack also the hickory, birch, elm, honey locust, barberry, hawthorn, and elder.

The natural increase of this insect being so great, a wise provision has been made to keep it within bounds. Besides enemies which attack the egg, and young larva, there are several parasites, which live within the body of the caterpillar and destroy it before reaching maturity; and in this way, their numbers, which would otherwise soon be alarming, are kept within moderate limits.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 137.)

[103.] 145. OICEOPTOMA [SILPHA] AMERICANUM *Linn.*—Length of body 8½ lines; breadth 7 lines. Taken in Nova Scotia by Capt. Hall.

Body very much depressed, thickly punctured with a hair issuing from each puncture; on the under-side black. Head with a round impression between the eyes: prothorax pale-yellow with a subquadrangular sublobate black spot in the disk; punctures of the prothorax very thick, those of the discoidal spot resembling scratches: elytra brown-black, rather silky, with two longitudinal, undulated, obsolete ridges that do not reach the apex; their surface is covered with irregular elevations, and near the suture is a series of punctiform impressions; epipleura very wide with its horizontal portion resplendent with a lustre between bronze and gold, vertical part, or inner margin, yellow; the suture of the elytra terminates in a minute point. Olivier says there are three ridges on the elytra, but only two are discernible in the specimen here described. It is singular that no author has noticed the brilliant side-covers of the elytra. [Synonymous with *S. peltata* Catesby. Common in Canada: north shore of Lake Superior (Agassiz).]

146. OICEOPTOMA [SILPHA] TERMINATUM *Kirby*. — Length of body 9¼ lines. Taken in Nova Scotia by Capt. Hall.

This species seems nearly related to *O. Americanum*, but it is narrower in proportion to its length, the front has a distinct oblong impression; the elytra are yellow at the apex and acuminate, which last is probably a sexual character; the epipleura is less brilliant than in the preceding species, and the elytra are not silky. In other respects it resembles it and may possibly be the female. [A variety of *Silpha peltata* Catesby; taken at Toronto by Mr. Couper.]

147. OICEOPTOMA [SILPHA] AFFINE *Kirby*.—Length of body 9 lines. Taken in Nova Scotia by Dr. Mac Culloch.

Very like the preceding species, but the frontal impression is smaller and round: the discoidal black spot of the prothorax is smaller, with the lateral lobes rounded, and with round confluent punctures: the horizontal part of the epipleura is black with a slight tint of blue, and not at all bronzed. [Also a variety of *S. peltata*. Taken at Toronto by Mr. Couper; and on north shore of Lake Superior by Agassiz's Expedition.]

MISCELLANEOUS NOTES

ON THE SWARMING OF DANAIS ARCHIPPUS.—On the first day of September, while driving along the Lake Shore Road, on the borders of Lake Erie, a mile or two south of Port Stanley, I was favoured with a sight which will not soon be forgotten. For several days previous, *Archippus* butterflies had been unusually abundant, and early in the morning of the day in question, some groups—numbering probably hundreds of individuals—which had rested during the night on trees adjoining the hotel at Port Stanley, were gyrating in a wild manner at all heights, some so far up that they appeared but as moving specks in the sky, others floating lower, over the tops of the trees, in an apparently aimless manner. This was, however, as a mere skirmishing party when compared with the vast hosts seen a little later.

It was about nine o'clock in the morning when, passing a group of trees forming a rude semicircle on the edge of a wood facing the lake, the leaves attracted attention: they seeming possessed of unusual motion, and displayed fitful patches of brilliant red. On alighting, a nearer

approach revealed the presence of vast numbers — I might safely say millions—of these butterflies clustering everywhere. I counted a small space, about the size of my two hands, on one of the trees, and there were thirty-two butterflies suspended on it, and the whole group of trees was hung in a similar manner. When disturbed, they flew up in immense numbers, filling the air, and after floating about a short time, gradually settled again. There appeared to be nothing on the trees to attract them, yet when undisturbed they appeared at this time, to prefer resting in quiet, as if enjoying the presence of congenial society. I regretted not having a net with me, as I should like to have captured a number of them to see in what proportion the sexes were represeted in the company. Their food plants—the various species of *Asclepias*—did not appear to be unusually common in that section. I apprehended that many of the individuals must have travelled some distance to be present at this gathering. The fact that the larva of *Archippus* is but seldom affected with parasites may partially account for their occasional abundance; I only know of one small ichneumon infesting them, and have seldom met with this.

W. SAUNDERS, London, Ont.

ABUNDANCE OF D. ARCHIPPUS IN MASSACHUSETTS.—I wish to call attention to the fact that *Danais archippus*, Fab., is exceedingly common all over New England this season. It is well known that many species of our butterflies have a year of great abundance, and then are almost unknown for quite a series of years. The cause of this is usually attributed to a scarcity of insect enemies, and a favorable season for their food. This abundance of a species is a sufficient reason for the multiplication of parasitic enemies, which increase to the point of almost total extermination of the species attacked, as well as themselves. Two years ago, *Cynthia cardui* was very abundant, and I obtained over one hundred larvæ, not one of which could I raise on account of a parasitic fly-larvæ which were so abundant as to lack food for their own maturity, practically exterminating one another. Since then I have not seen a single *cardui*. Whether the parasitic fly is common I am unable to say. I am confident that to some extent the above is true of many species, but *D. archippus* never has to my knowledge any enemies, for this year I have raised abundance of larvæ and taken many chrysalids; but all were sound. Therefore we must hunt for some other cause of their disappearance. Perhaps others more interested in Lepidoptera than myself may have gathered facts which will throw light upon this subject, and to draw out these experiences induces

me to write this note. My little son has found a parasite in the chrysalis of *Pieris rapae*, Sch., which I will report on as soon as worked up.

PHILIP S. SPRAGUE, Boston, Mass.

COCOONS MADE BY SNOUT-BEETLES.—I was sorry to find, upon glancing over my late communication that, as it appears on page 118, I have in my haste made too sweeping an assertion in stating that "*Curculionidous* larvæ do not spin silken cocoons," (lines 16 and 17). I know of none in this country which have any such power of spinning, and this is so very generally the case with the family that it may almost be stated as a rule. Yet, Westwood in his *Introduction* mentions, on other authority, several instances of such spinning, some of which I am inclined to think must be taken *cum grano salis*. It will be well to instance them, however. On page 337 (Vol. II.) he speaks of the perfect female of *Rhynchites bacchus*, Linn., as lining her nidus with silk, yet from the writings of Kollar, Nordlinger, Boisduval and others, we may learn that this nidus is simply closed with a glutinous substance, and whether secreted from the mouth or anus does not appear so clear. Again, on page 341, mention is made of an undetermined species which in the larva state draws the clusters of apple blossoms together by means of a web. This is on the authority of *Salisbury on Orchards*, which I cannot consider very trustworthy. But on page 343 we find sufficiently authentic notices of cocoons spun by larvæ belonging to the genera *Hypera* and *Cionus*, and by another weevil named *Curculio pimpinellæ:* my statement should, therefore, be qualified.

C. V. RILEY.

ARTIFICIAL COLOURING OF LEPIDOPTERA.—At a recent meeting of the Entomological Society of London, (England), Mr. Butler exhibited species of Lepidoptera, upon which experiments had been made by Mr. Meldola, with regard to testing the effects of dyes. The insects were *Pieris brassicæ* and *napi*, *Gonopteryx rhamni*, *Vanessa urticæ*, *Pyrameis Atalanta* and *Arctia caja*. The most striking effects were observable in *P. napi* dyed black, and *A. caja* dyed metallic-green and magenta. The dyes used were aniline. Mr. Meldola dissolved the dyes in spirits of wine and laid them on with a camel-hair pencil. Not being satisfied with Mr. Meldola's experiments, Mr. Butler resolved upon performing others on his own account; but being then ignorant of the system pursued, he dissolved his dyes in hot water, and discovered that the specimens would not take them. He then made a solution of soda, into which he dipped *G. rhamni*, and found that the yellow pigment immediately united with

the soda, and was discharged into the solution, which it visibly coloured, and he saw no reason why, if a sufficient number of individuals were experimented upon, the colour should not be collected and utilised. *Colias Edusa* and *Hyale*, *Danais Chrysippus* and *Vanessa urticæ*, were deprived of their natural colours in the same manner. Mr. Butler had experimented upon *G. rhamni* (dyed blue), *C. Edusa* and *Hyale*, *Papilio Demoleus*, *Lycæna Corydon*, *Danais Chrysippus*, *Argynnis Adippe* and *Aglaia*, *Vanessa urticæ*, *Epinephele Janira*, *Arctia caja* and *villica*. The most successful results were obtained with *Danais Chrysippus*, deprived of its natural colours and dyed blue, which colour only entered certain scales, whereas magenta, being a faster dye, entered all: and *V. urticæ*, dyed blue in one case, and magenta in another; the latter resembled a typical South-African *Junonia*, the former a melanitic variety of the same species. The peculiarity in these specimens consisted in certain parts of the wings not taking the dye, leading to the conclusion that the scales are more perfectly closed in these parts.

Mr. Meldola (who was present as a visitor) remarked that he had also made experiments with alkalies; the yellow of *G.rhamni* being removed by soda, and precipitated by the addition of an acid. He possessed an example of *Vanessa Io* altered to deep mahogany-colour by exposure to the fumes of ammonia.

Mr. Bicknell exhibited a number of examples of *Gonopteryx rhamni*, upon which he had experimented with cyanide of potassium, as suggested at the last meeting. The yellow was changed to orange-red in the parts exposed to the cyanide.

Mr. F. Smith stated that he had seen a number of wasps that had been killed by cyanide of potassium, and which, in consequence, were changed to vermilion.

The hope was expressed that these interesting experiments would not be taken advantage of by unscrupulous persons, in consequence of the prevailing disposition to pay high prices for varieties of common Lepidoptera.—THE ZOOLOGIST.

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In future, separate receipts for subscriptions will be sent with the next number of the CANADIAN ENTOMOLOGIST that is issued after the reception by the Secretary of any such remittances.

EXCHANGES, &c.

The undersigned would be pleased to open communications with any Entomologist in Canada, United States or England with a view to exchanging specimens. Address JAMES COLWELL, care of A. CHOUN, Kingston, Ont.

THE undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address EDW. L. GRAEF, 40 Court St., Brooklyn, N. Y., U. S.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

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AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

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MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 149.

LITHOCOLLETIS.

27. Lithocolletis ? Ornatella. N. sp.

This is the insect previously mentioned in these papers as *Leucanthiza Ornatella*. At first I was inclined to place it in *Lithocolletis*, but a consideration of some of its peculiarities induced me to place it provisionally in Dr. Clemens' genus, *Leucanthiza*. On examination of the neuration of the wings, however, and of some other points in its structure and habits, it seems to me to belong more properly to *Lithocolletis*, though it differs from it in some respects and approaches *Leucanthiza*, and more remotely, *Phyllocnistis* and *Lyonetia*. The tuft is small, resembling that of *Leucanthiza* more than *Lithocolletis*. The palpi, ascending in the living insect as in both of those genera, are, after death, usually, not simply drooping as in *Lithocolletis*, but laid side by side upon the coxæ as in *Lyonetia*. Sometimes, however, they are simply drooping. (Where the "Micro" is killed by the fumes of chloroform—as I usually kill them—the positions of the palpi, tongue and wings are variable, and do not afford good generic characters.) The larva, perhaps, resembles that of *Leucanthiza* most nearly, having the head too much rounded and the sides of the segments more distinctly mammillated than the flat larva of *Lithocolletis*. It also usually leaves the mine and pupates in a yellowish silken *nidus*, in which it resembles *Leucanthiza* and *Lyonetia* more than it does *Lithocolletis*. The wings, however, have fewer veins than those of either *Leucanthiza* or *Lyonetia*, and approach very nearly in their neuration to some species of *Lithocolletis*, though also differing slightly from it. *Lyonetia* has a smooth head, longer palpi, and the basal joint of the antennæ expanded so as to form an eye-cap, and there are *four marginal nervules emitted from the sub-costal vein*. The mine is a long narrow winding track like that of *Phyllocnistis*, and in all of these respects it differs from this

insect, and it also differs in the form of the larva. *Phyllocnistis* differs in the form of the larva and of the mine. It pupates in the mine ; the head is smooth, and the anterior wings are caudate. In all of these respects it clearly differs from this insect. The neuration of the anterior wings, however, differs from that of this insect only in having *one more marginal nervule given off from the median vein.* In *Lithocolletis* there is *one nervule emitted from the tip of the discal cell,* and it passes to the tip of the wing. In *Leucanthiza there are two :* one going to the costa, the other to the hind margin. In this insect *there is but one ; but that one is furcate, sending a branch to the inner margin, and one to the tip.* In *Leucanthiza* the subcostal *sends three short veins to the costa.* In *Lithocolletis it sends but two, and in many species one of them is emitted at the base of the apical nervule,* while in others they are both more remote from the apical nervule as they also are in *Leucanthiza.* In this insect the subcostal sends but *two nervules to the costa, one of which is emitted at the base of the apical nervule,* as in some species of *Lithocolletis.* In *Leucanthiza* and in *Lithocolletis,* so far as I have observed (except in *Lithocolletis desmodiella*) and in *Phyllocnistis,* the median vein sends two nervules to the hinder margin, whilst in this insect and in *L. desmodiella* it sends but one. *L. desmodiella* also strongly resembles this insect in the pattern of ornamentation ; but it belongs to the division of that genus which has cylindrical larvæ. Clemens states that *the subcostal vein of the hind wings is simple* in *Leucanthiza.* I have not examined it. He also says that *it is simple* in *Lithocolletis ;* but I have found it *distinctly furcate in every species that I have examined,* and I have examined several. He says that *it is furcate* in *Phyllocnistis.* But I have *found it simple* in *P. vitifoliella* n. sp. He says *that it is furcate* in *Lyonetia.* I have not examined it. In this species *it is distinctly furcate,* precisely as I have found it in *Lithocolletis* and as Clemens describes it in *Lyonetia.*

This insect, therefore, seems to me to approach more nearly to *Lithocolletis* both in pattern of colouration and structure, than to any of the above named genera, although it is very near to *Leucanthiza,* if it does not in fact bridge over the differences between them, and reunite *Leucanthiza* to *Lithocolletis*—from which Dr. Clemens separated it. The pattern of colouration in the wings of *Leucanthiza* also differs from this insect, though the shades of the colours, and the disposition of them on the head, thorax, and base of the wings is the same in the only species described by Dr. Clemens, viz.: *Leucanthiza Amphicarpeaefoliella.*

This insect, therefore, is properly placed in *Lithocolletis,* or a new

genus must be created for it; and I am averse to the multiplication of genera on small differences. And if this insect is properly placed in *Lithocolletis*, then *Leucanthiza* only differs from *Lithocolletis* in the neuration of the wings and but little in that.

The tongue is yellowish : palpi silvery white. Face, under surface and legs, silvery white, opalescent or purplish, according to the light. The legs are marked with golden brown on their anterior surfaces. Antennæ brown, opalescent in some lights. Tuft, thorax, and base of the wings, maroon, opalescent or golden, according to the light, more golden towards the dorsal margin of the wing, and brownish towards the costa, passing at about the basal ¼ into a dark maroon band, which forms the dark internal margin of the first silver-white fascia ; behind this fascia, the wing is pale golden, passing into deep golden, then brownish golden, and into the deep maroon internal margin of the second silvery-white fascia which is placed about the middle of the wing ; then the same succession of colours to the third fascia, which is slightly intercepted in the middle ; then the same succession of colours to a costal white streak at the base of the ciliæ, and an apposite dorsal one ; these streaks are also faintly dark margined on the apical side. Apical portion of the wing bright golden, ciliæ silvery, with a wide maroon-brown hinder-marginal line at the base. The golden portions of the wing vary with the light from golden to a red saffron, suffused with purple or brown, and the fasciæ are white, silvery, or steel-gray. The cocoon is yellow. The larva is that described by Dr. Fitch as the larva of his *Anacampsis robiniella*. The mine is flat, yellowish, and upon either side of the leaflet of the Locust *(Robinia pseudacacia)*, and the Rose acacia *(R. hispida)*. Alar. ex. ¼ inch. Common in Kentucky. *(L. robiniella* also feeds on *R. hispida)*.

28. L. Salicifoliella.

In *Proc. Ent. Soc. Phila., VI., p. 77 and p. 81*, Dr. Clemens applies this name to a species which was known to him only by its mine, which, he says, is "near the base along the edge" of the leaves of the yellow willow *(Salix Alba)*, and the mines were empty. He found the mines in the latter part of July. Dr. Packard mentions the species *(Guide, p. 353)* on the authority of Dr. Clemens. But the insect remains unknown unless that presently described is the same, as I believe it to be. I have two specimens, differing slightly from each other, as noted below, but which I have no doubt are of the same species. One was bred from a mine on the underside of a leaf of the Weeping Willow *(S. Babylonica)*; the

other from a mine on the underside of a leaf of *S. longifolia*; and I have found empty mines exactly like them and containing the same dark brown pupa skin, on the leaves of the Yellow Willow *(S. alba)*, and it was in leaves of this species that Dr. Clemens found his mines. These mines were not "near the base along the edge," and were not confined to any particular portion of the under surface. I have seen another smaller mine near the base and at the edge of the leaf, which may be that of a *Lithocolletis*, but which is more probably that of a *Gracillaria*. And I have but little doubt that the species now to be described is the same that was referred to by Dr. Clemens. But I am not certain that it is not the European species *L. pastorella*. That species also feeds on *S. alba*, which, as well as *S. Babylonica*, is an imported species, and if either of these trees is its original food-plant, then *L. salicifoliella* is not an indigenous species. But if *S. longifolia* is its original food-plant, then it is. In Stainton's arrangement of the species, *L. pastorella* belongs to his group 5. "Anterior wings dull whitish-gray, with indistinct darker marginal markings;" and he places it next before *L. populifoliella*, which he figures. *(Nat. Hist. Tin. v. 2, plate 7, fig. 1)* and which has, as figured, a strong general resemblance to this insect. It is therefore not impossible that this is *L. pastorella*. It is intermediate between *L. populifoliella* and *L. sylvella* as figured by Stainton, and in the arrangement of the species which I have followed, it should follow *L. hamadryadella*, which also bears considerable resemblance to *L. sylvella*. *L. hamadryadella*, however, resembles this species rather in the colour of the markings than in the arrangement of them.

The specimen from the Weeping Willow has the palpi and face white, the face flecked with a few pale yellowish gray scales. Tuft brown with intermixed grayish-brown scales. Antennæ white, each joint tipped above with pale grayish-brown. Thorax and anterior wings white, thickly dusted with grayish-brown, and the markings of the wings are drab, gray-brown or pale golden, according to the light. There is an oblong streak of this indescribable hue on the base of the costal margin, and a rather indistinct patch of the same near the base of the dorsal margin, but not touching the margin; a slightly curved, angulated fascia of the same hue at about the basal fourth: a slightly oblique, rather wide costal streak of the same hue just before the middle, and dark-margined behind upon the costa: it extends to the middle of the disc, where it is bent backwards, and is posteriorly produced almost to another straight fascia of the same hue, which is placed behind the middle, it is

slightly interrupted in the middle, and is narrowly dark-margined posteriorly; (on one wing it is not interrupted, but it is angulated and produced posteriorly); another rather wide fascia of the same hue, before the ciliæ slightly produced along the base of the dorsal ciliæ. An apical *brown* streak and a costo-apical streak (of the same hue as the fasciæ), which reaches the inner end of the brown streak and is there bent backwards passing around the end of the brown streak, and in a direction nearly parallel with it to the dorsal ciliæ just behind the apex. Hinder marginal line at the base of the apical ciliæ golden brown. Ciliæ pale golden. The specimen from *S. longifolia* is scarcely at all dusted, the markings are paler and narrower, though similarly disposed, and the white ground colour is not so marked as in the other, but I have no doubt they are of the same species.

29. *L. juglandiella.*

Dr. Clemens *(loc. cit.)* names this species also from the larva which he found mining the upper surface of leaflets of the Black Walnut *(Juglans nigra)*, and Dr. Packard refers to it in the same way as to the last named species. Dr. Clemens suggests the probability that it may be identical with *L. caryaefoliella.* I have never found it on the Walnut, but have occasionally, though rarely, found it in the leaves of the Butternut, *(Juglans cinerea)*, and judging from the larva, without having bred the imago, I have no doubt that it is *L. caryaefoliella.* Clemens, *ante p. 109.*

L. tubiferella. Clem. *Proc. Acad. Nat. Sci., Phila., June, 1860, p. 208.*

I have not succeeded as yet in getting this species from the mine, and have never seen the imago. But I have found on the upper surface of leaves of the White Oak *(Quercus alba)* a larva and mine which I believe to be the same described by Dr. Clemens. It is a long, rather narrow band, gradually widening, in which the larva lies transversely, eating first upon one and then upon the other side, so that the frass is deposited in a narrow line along each side. Dr. Clemens has alluded to the peculiar appearance of the larva, which in fact differs from the ordinary flat *Lithocolletis* larva, as much as that does from the larva of the first group (cylindrical). It is considerably larger, vertically thicker, depressed but not flat, the head is more obtusely rounded in front, and the sides of the segments are more distinctly mamillated. The cuticle is sleek and shining. It is white, with the alimentary canal nearly colourless or watery, and the contents of the body on each side of it white and granular. It remains much longer in the larval state than the other species, and hence is much more

difficult to rear. It eats voraciously for a few days, and then remains quiet without appearing to eat at all for several days.

A larva precisely like it, but in a different blotch mine, inhabits the leaves of the Black Oak *(Q. ilicifolia?)*.

Another like it, but with the mine a little different from the last, inhabits oaks of the Willow Oak group. Another still inhabits leaves of the Beech *(Fagus ferruginea)*.

Still another in the leaves of the Sugar Maple *(Acer saccharinum)*.

Another (two others?) similar but different, mines the leaves of different species of *Desmodium*.

I have never known one of them to enter the pupal state, though I have kept them nearly two months in the larval state, in which condition they still remain alive in the dead leaves, as if they would hybernate as larvae. The Black Oak species and that of the *Desmodium* construct little circular depressed cocoons like those of *L. coryliella*, &c., in which the larvae are reposing. (The *Desmodium* larvae are distinct from the others, and may possibly produce a *Leucanthiza* or some other allied genus). I think there can be but one brood in a year, and that larvae found in July continue to be larvae until the next spring.

I have met also with the following larvae of the second (flat) group and mining the upper surface of the leaves. Possibly some of them may prove to be the same with species already described, but I scarcely expect it. Most, if not all, are new species. One mines the leaves of the Chestnut *(Castanea)*.

Two species, if not three, mine those of oaks of the Willow Oak group. One mines those of the Water Beech *(Carpinus Americana)*, and also of the Hornbeam or Ironwood *(Ostrya Virginica)*.

Of the first (cylindrical) group there is the species (perhaps two species) mining leaves of the *(Helianthus)* Wild Sun Flower.

A species which *may* prove to be *L. crataegella* mining leaves of the Wild Red Plum *(Prunus Americana)*.

And a species which is probably *L. basistrigella*, mining the leaves of Black Oaks *(Q. ilicifolia, &c.)* The mine and cocoon are the same, with those of *L. basistrigella* on the White and Chestnut Oaks.

Also a mine on the upper surface of Haw leaves *(Crataegus)* which seems to be identical with that of *L. virginiella* on the *Ostrya virginica*.

DESCRIPTION OF A NEW ARCTIA FROM COLORADO.

BY CHAS. R. DODGE, WASHINGTON, D. C.

FIG 34.

ARCTIA WILLIAMSII, *n. sp.*—(See fig. 34). Anterior wings rich chocolate-brown with creamy white stripes or markings. Costal margin lighter brown. A broad line running from the base of the median vein nearly to the posterior angle, where it becomes slightly forked; from this proceeds a slightly curved narrower branch, from the centre of the wing nearly to the costal edge, and one-third the distance from the apex; a zigzag mark composed of three straight lines, the first being the broadest, and the third one-half the length of the others, proceeds from the outer angle, where it joins the first line, and terminates under the costal edge; the whole forming a distinct W crossed at the top by the transverse band. Inner edge faintly marked with creamy white.

Posterior wings dull red, marked with dark brown spots. Inner edge yellowish; costa and outer edge with a dark border, formed by confluent spots, narrowest at the middle third, the spot at the posterior angle more prominent, and triangular in shape; a large heart-shaped spot occupies the centre of the outer third of the wing, nearly touching the outer edge, and is surrounded by four smaller spots, the one near the inner margin wedge-shaped and extending to the base of the wing. Fringes dirty yellow. Alar. expanse 1-15 inch.

Antennæ brown. Head creamy white above, brownish around the eyes. Thorax brown with lateral lines of creamy white; shoulder tippets edged with same colour. Body beneath uniform light brown; above, darker, with two broad red lateral stripes which become yellowish at the tip. Habitat.—Colorado Territory.

This beautiful little species is dedicated to Mr. Henry T. Williams, of the "Horticulturist," to whom I am indebted, more than to any other person, for my summer's ramble through the Rocky Mountains.

The accompanying figure, though not quite correct in detail, will give an idea of the markings by which this moth is characterized. On the anterior wing, the upper fork of the line running from the base, is too heavy, and too long, giving the appearance of *four* zig-zag marks when there are but *three*, while the spots on the hind wings, though correctly placed, are not in every instance exactly of the right shape.

ON A NEW GRASSHOPPER FROM COLORADO.

BY C. THOMAS, WASHINGTON, D. C.

Caloptenus Dodgei. Nov. sp.

Posterior femora with three white bands; elytra not more than half the length of the abdomen.

Male. Small size. Vortex elongate, distinctly channelled; frontal costa broad, flat and squarely margined above the ocellus, margin punctured; antennæ thick, passing the thorax, joints short, distinct, and somewhat obconic. Transverse incisions of the pronotum distinct; posterior lateral margins very slightly incurved at the humerus; median carina distinct only on the anterior and posterior lobes. Elytra about half the length of the abdomen, oblong-ovate. Posterior femora about as long as the abdomen. Prosternal point thick, obtuse, transverse. Cerci slender: sub-anal plate somewhat pointed, the margin on the upper surface entire.

Colour. Brown varied with white. Face cinereous, occiput and disk of the pronotum dark brown, mottled with lighter and darker shades, except the posterior lobe, which is uniform brown. Elytra brown, lower half very dark; on each side of the head and pronotum, behind the eye, is a dark brown glabrous spot, not extending further back than the third incision. A white oblique spot above the posterior coxæ. Posterior femora with three white bands on the outside, the one nearest the apex much the smallest, the middle dark band abruptly bent forward at the middle of the disk. Abdomen pale, mottled with reddish-brown. Four anterior tibiæ pale reddish-brown. Antennae pale at base, the rest rufous.

Female. Pronotum uniform dark brown, except the spot on the side, and that the posterior lobe is a bright reddish-brown. Elytra extend over but two segments. Abdomen brown.

Dimensions. ♀ Length .85 in.; elytra .2; posterior femora .4; posterior tibiæ .32. ♂ Length .56 in.; elytra .18; posterior femora .37; posterior tibiæ .26.

Pike's Peak, Colorado Territory.

Named in honor of Mr. Charles R. Dodge of the Agricultural Department, Washington, who recently discovered it during an ascent of Pike's Peak.

It is important in one respect, showing the effect of altitude (about 10,000 feet above the level of the sea) on the antennæ, contracting their length, but compensating by thickening; also rendering the joints more distinct. It approaches *Pezolettix* in two respects, the shortness of the wings, and the slope of the posterior lateral margins of the pronotum.

NEW ENEMIES OF THE COLORADO POTATO BEETLE.

BY E. B. REED, LONDON, ONT.

MYSIA 15 PUNCTATA, *Oliv.*

Sometime during the latter part of July last, while wandering about the outskirts of a large potato patch, and examining the damage caused by the Colorado beetle, I found on the vines the larva of a beetle belonging to the family of *Coccinellidæ* or Lady Birds. The insect was new to me, and although there were no larvæ of the Colorado beetle in the immediate vicinity, yet I was in hope that I had discovered a new enemy of our abominable pest. To test the question more at leisure, I took my newly-found treasure home, and placed it in a box, wherein were numerous specimens of Colorado larvæ in all stages, from the diabolical looking little monster just hatched from the egg, to the full-grown, fat, and repulsive larva dragging its bloated body slowly about in search of some convenient place to undergo the transformation into the pupal state. The box was roomy and covered with a glass top, so that I had ample opportunities of observing what took place. After a little preliminary tour of inspection, my Lady Bird friend caught sight of a small Colorado, and immediately made a bee line for it, and commenced a fierce attack upon the unhappy little victim, seizing it in the powerful jaws, with which Dame Nature has provided most of these creatures, and in the course of a very few minutes sucking the juices completely out, and leaving only the dry and blackened looking skin as a ghastly monument of its victory. It then commenced its attacks, after a short interval, on a full-grown specimen, which, however, had strong objections to be eaten all-alive-oh, and struggled viciously with its enemy, which was not nearly so large, although of course much more active. Its efforts at resistance were vain, and after Mr. Lady Bird had got its jaws firmly fixed in its victim's broad and capacious back, the struggles soon ceased, and it became a question of the capacity of the Lady Bird larva, to contain all the juices that were in the body of its corpulent victim. Nearly an hour was occupied in this little operation, and when it was over, our friend retired to rest on its laurels and digest its enormous meal at its leisure.

For several days I watched at different times a repetition of the same thing, and the Lady Bird must have consumed some eight or nine Colorado larvae. I regret that I neglected to make any description of

the larva; and, being called away from home just at this time, I found on my return that the larva had gone into chrysalis, and in a few days afterwards, the perfect beetle emerged, and proved to be a very light-coloured specimen of *Mysia 15 punctata* Oliv. (Fig. 35). This beetle, as may be seen from the engraving, varies very much in its perfect form, so

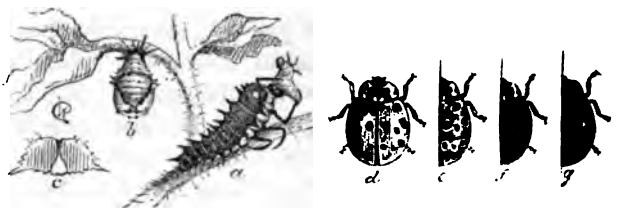


FIG. 35.

much so, indeed, that a careless or unskilled observer would never imagine that these four insects belonged to one and the same species.

PERILLUS CIRCUMCINCTUS, *Say*.

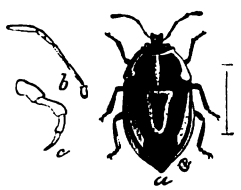


FIG 36.

This insect (Fig. 36) belongs to the *Heteroptera Hemiptera*, or true Bug family. It was brought to me by a friend, who had detected it in the act of killing a Colorado Beetle larva, by piercing the soft body of the larva with its long rostrum or beak.

I placed this insect also in my glass-covered box, and watched its operations, and mode of attack. It moved very quietly, and attacked the larva with a sudden dart of its sharp-pointed beak. The larva, of course, struggled with all its power, yet it never seemed at all to loosen the hold of the bug, which rather astonished me, for I am at a loss to see what enables the beak to be retained so firmly; for, as far as I can ascertain, the beak is tolerably smooth, and easy of withdrawal if the bug is willing. Yet, when I attempted to take the larva off the beak, I had to use some slight degree of force. The bug, moreover, has a curious fashion of planting himself squarely and firmly on his feet, with the beak raised nearly horizontal, and the victim poised, or spitted on it, and writhing about quite clear of the ground.

I had the curiosity to weigh the bug, and also a larva which I saw it attacking, and the larva was very nearly as heavy as the bug, and yet it seemed no exertion to the bug to raise its victim on the point of its beak, and hold it suspended there while it sucked out the contents of the body.

Whether the close confinement of the box was not calculated to pro-

mote its general health, or whether the diet of Colorado larvæ was too overpowering, I do not know; but after eating about half a dozen larvæ, my bug seemed to lose his appetite. So I at once killed him, and sent him for identification to Mr. Riley, who named it for me. Both the drawings of these two new insect friends are from the clever pencil of Mr. Riley, who kindly permitted me to obtain electrotypes of them.

I shall be glad to hear from any of the members of the Society residing in Ontario, whether the Colorado beetle has done much damage in their neighbourhood. In many places, I am aware, some mischief has been caused, but the potato crop generally seems to have been an unusually good one, even in those districts where the beetle was prevalent.

I would also ask the members to keep a sharp look out for any parasites or other enemies which they may discover attacking the Colorado larvæ. We know already of sixteen, and we hope that the number may largely increase. Any communications on this subject will be gladly received.

CHICAGO FIRE—APPEAL TO ENTOMOLOGISTS.

Mr. J. Q. A. Warren, of England, recently residing temporarily in Chicago, writes to us from St. Paul's, Minn., as follows:—"Having lost my entire collection, by the fire in Chicago, of Entomological and other Natural History specimens, the work of the past year in the West, as well as of years abroad, I beg to solicit correspondence and specimens from American Entomologists for a new collection, for which I will send European duplicates as soon as I reach Europe. My loss is heavy, over $3000, and the patient labour of months.

"Help me all you can, and I will appreciate it fully, and do all I can in return. Address me at New York after Nov. 1st., care of Adams' Express Company, for parcels, and by mail to New York post office."

Mr. Warren, we understand, had a very large collection in Chicago, which he was intending to take back to England this winter, but it was entirely consumed in the great fire. He is anxious to replace it, as far as possible, before his return, which will be in December. We trust that all our readers, who have it in their power, will assist Mr. Warren with specimens, and enable him to take back a goodly representation of the Insect life of this country.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 156.)

[104]. 148. OICEOPTOMA [SILPHA] CANADENSE *Kirby*.— Length of body 7 lines. Taken in dead fish on the shores of Lake Huron in Canada, by Dr. Bigsby.

This species approaches near to *O. Americanum*, but it is smaller, the frontal impression is deeper and oblong; the discoidal spot of the prothorax is much larger, extending from the anterior to the posterior margin, it is scarcely at all lobed, and only the punctures of its posterior part exhibit the appearance of angular scratches: the elytra are dirty-yellow at the apex, and the yellow occupies a much greater portion of the extremity than in the two preceding species, they are not acuminate at the tip, but have a very slight tendency to a sinus; the epipleura in colour resembles that of *O. Americanum*, but is less brilliant. [Also a variety of *S. peltata*.]

FAMILY TROGOSITIDÆ.

149. PELTIS FERRUGINEA *Linn.*— Length of body 5 lines. A single specimen taken in the journey from New York to Cumberland-house. The insects of this genus are usually to be met with under the bark of trees, and in fungi.

[105.] Body oblong, flat, ferruginous, resembling greatly, as De Geer has observed, the common bed-bug. Head thickly punctured: prothorax deeply emarginate for the reception of the head, thickly punctured; lateral margin sloping, reflexed: disk of the elytra with six elevated ridges gradually diminishing in length from the suture outwards; between the ridges is a double row of punctures, each pair of punctures being connected by a transverse furrow; outside the discoidal ridges are several irregular rows of punctures; lateral margin reflexed; epipleura linear at the apex, gradually dilated at the base. [Taken in Canada.]

FAMILY NITIDULIDÆ.

150. NITIDULA OBSCURA *Fabr.* Length of body $2\frac{1}{4}$ $2\frac{1}{3}$ lines. Several specimens taken in Lat. 65°.

Body subdepressed, black, with its lustre obscured by inconspicuous decumbent subcinereous hairs. Head minutely punctured, transversely impressed between the eyes: occiput elevated: mouth and stalk of the

antennæ piceous; prothorax minutely punctured, most visibly at the sides, which are depressed; lateral margin reflexed; elytra very obtuse at the apex, they have the appearance of being acuducted which seems to be produced by the pubescence: legs piceous or rufo-piceous.

[106.] 151. NITIDULA OSSIUM *Kirby*.—Length of body 1½—1¾ lines. Several specimens taken in Lat. 65°.

Mr. Stephens regards this as a variety only of the preceding species, but it is smaller, narrower in proportion, the legs and stalk of the antennæ are paler, and the elytra and sides of the prothorax, in the British as well as American specimens, are piceous. In other respects they agree.

152. NITIDULA DISCOIDEA *Fabr*.—Length of body 1⅓ lines. Many specimens taken in Lat. 65°.

Considerably smaller than the British specimens. Body subdepressed, black, above minutely punctured, subpubescent. Stalk of the antennæ; sides of the prothorax, which has posteriorly a pair of discoidal obsolete impressions, legs and anus, rufous: elytra with a large anterior discoidal suborbicular pale-rufous spot common to both, in which, in some specimens, is a black dot; apex of the elytra obscurely variegated with rufous. Fabricus, and after him Mr. Marsham, describes the legs of this species as black; but others have properly denominated them by the term ferruginous and piceous. In the American specimens they vary in colour from piceous to pale-rufous.

[107.] 153. IPS DE JEANII *Kirby*.—Plate ii., fig. 4.—Length of body 2¼ lines. Three specimens taken in Lat. 65°.

Body linear, depressed, thickly and minutely punctured, glossy, black or dark piceous. Head with a punctiform impression in the vertex, and a larger impression on each side between the eyes; prothorax quadrangular, rather narrowest behind: elytra piceous or ruto-piceous, with two oblong white spots at the base, forming an interrupted line, and two oblique nearly parallel ones below the middle: legs piceous. In the other sex the elytra are subacuminate. VARIETY B. With five white spots, viz.: 1, 2, 2. [Taken in Canada; and north shore of Lake Superior (Agassiz).]

[108.] 154. CHOLEVA (CATOPS) SPENCIANA *Kirby*.—Length of body 2 lines. A single specimen taken. Locality not stated.

Body black, covered with decumbent pale hairs. Head minutely punctured; antennæ shorter than the prothorax, the two first joints ferruginous, the eighth shorter and smaller than the rest; mouth and palpi ferruginous: prothorax not visibly punctured with all the angles

rounded ; base with a slight sinus on each side : elytra acute, very minutely punctured with a hair emerging from each puncture, without furrows except a single one parallel with the suture, ferruginous, black at the tip : abdomen piceous, rufous at the base : legs ferruginous. [Belongs to the family *Silphidæ*.]

[109.] FAMILY SCAPHIDIIDÆ.

155. SCAPHIUM CASTANIPES *Kirby*.—Plate v., fig. 1. — Length of body 3 lines. A single specimen taken in the journey from New York to Cumberland-house.

Body naked, glossy ; underneath smooth, black, with a very light shade of bronze ; above more evidently bronzed, punctured. Mouth, palpi, and antennæ pale chestnut : prothorax behind, on each side, marked with a pair of punctiform impressions, between these impressions are several large punctures, but not in a regular transverse series as in *Scaphidium* : elytra with six discoidal rows of punctures ; the four rows nearest the suture reach the base, but not the apex, and the two external ones neither base nor apex ; the first row also terminates towards the base in three large distinct punctures, and from the base of the third runs a transverse row, as in *Scaphidium*, to the sutural furrow, which is impunctured : the legs are pale chestnut.

[110.] FAMILY ANISOTOMIDÆ.

156. LEIODES PUNCTO-STRIATUS *Kirby*.— Length of body 1 line. A single specimen taken in Lat. 65°.

Body hemispherico-ovate, naked, glossy, chestnut. Head very lightly punctured ; mandibles rather prominent ; palpi and antennæ rufous, clava of the latter much incrassated consisting of five joints, the second of which is extremely minute : prothorax very large, wider than long, very lightly punctured, with the sides paler than the disk : elytra deeply and grossly punctured in rows, interstices impunctured : legs and under-side of the prothorax rufous : anus paler than the rest of the abdomen. This species closely resembles the *Anisotoma badia* of Sturm, but the elytra are not *finely* punctured, as Mr. Stephens describes them in that species.

FAMILY SYLVANIDÆ [LATHRIDIIDÆ.]

157. CORTICARIA DENTICULATA *Kirby*.— Length of body 1 line. A single specimen taken in Lat. 65°.

[111.] Body dark piceous, rather glossy, naked, minutely punctured. Prothorax rather orbicular, with a circular deepish impression just above the scutellum ; sides distinctly denticulated : elytra with several rows of

punctures. The insect here described approaches very near to *C. impressa* Marsham, but it is sufficiently distinguished not only by its colour but chiefly by the very visibly denticulated sides of its prothorax. [As the specific name of this insect is preoccupied, it has been named *C. Kirbyi* by Dr. Le Conte. Taken by Agassiz's Expedition on the north shore of Lake Superior.]

FAMILY CRYPTOPHAGIDÆ.

[112.] 158. ATOMARIA ATRA *Stephens*. Length of body 2⅓ lines. One specimen only taken.

Body black, punctured, glossy. Mouth reddish; antennae rufous: elytra pubescent, piceous, rufous at the tip: anus and legs rufous.

159. CRYPTOPHAGUS HUMERALIS *Kirby*.—Length of body 1¾ line. Several specimens taken in Lat. 54°.

Body subcylindrical, black; above punctured and pubescent, rather glossy. Prothorax rather widest behind, with the basilar angles somewhat depressed: scutellum transverse, obtusangular: shoulders of the elytra obscurely rufous: legs, especially the tibiæ and tarsi, pale chestnut.

160. CRYPTOPHAGUS CONCOLOR *Kirby*.—Length of body body 1½ line. A single specimen taken in Lat 54°.

[113]. In shape, sculpture and pubescence this species resembles the preceding, but it is smaller, and the whole insect is entirely of one colour —dark ferruginous.

N. B.—The two species last described differ from the other *Cryptophagi* in having the thorax without serratures or denticles, and the scutellum obtusangular, and may perhaps form a subgenus.

FAMILY DERMESTIDÆ.

161. ATTAGENUS CYLINDRICUS *Kirby*. Plate vii., fig. 3.—Length of body 2 lines. Two specimens taken in the Rocky Mountains.

This little species has much the air of a *Cryptophagus*, but belongs to the present genus. The body is subcylindrical, dark-piceous, very minutely punctured, and covered, but not thickly, with decumbent cinereous hairs. The two first joints of the antennae are large, globular, and of the same colour with the rest of the body; the intermediate ones very minute and pale rufous; the three last are incrassated and form an oblong piceous knob, of which the terminal joint is as long as the two preceding ones, ovate and acute: the prothorax behind is very obsoletely trilobed with the intermediate lobe rounded: the tarsi are rufous. (Unknown to Dr. Le Conte.]

[114.] 162. ATTAGENUS PELLIO *Linn.*- Length of body 2¾ lines. Taken in Nova Scotia by Capt. Hall.

This species, though particularly destructive to furs, is to be met with in other animal matters, and is very common in houses. De Geer describes its larva as having a very long body covered with a hard, shining skin of a reddish-brown colour and hairy; as having six legs, and the posterior extremity terminated by a long remarkable tail, formed of rufous hairs as long as the body, and placed horizontally in the same line. He says that their motion is gliding, but by snatches.

The American specimen, which is a male, is considerably larger than my British ones and blacker; but in other respects it precisely resembles them. The species may generally be known by its black or dark-piceous colour, covered, especially underneath, with decumbent whitish or cinereous hairs. The stalk of the antennae, and the tarsi, are testaceous, and the last joint of the former, in the male, is longer than the two first and cylindrical: the prothorax at the three posterior angles has three white spots formed of hairs, and the elytra are in the middle near the suture. [Taken in Canada].

[115.] 163. DERMESTES LARDARIUS *Linn.* – Taken in Nova Scotia by Capt. Hall; in Massachusetts by Mr. Drake. Latreille observes that this insect is found in every quarter of the old world. [We may add, in the *new* as well. It is a great pest to collectors in Canada.]

164. DERMESTES DISSECTOR *Kirby.* – Length of body 3⅓ lines. Taken by Dr. Bigsby in Canada. [Apparently identical with Say's *D. nubilus* (Ent. Works, i. p. 300), which differs little, if at all, from *D. caninus* Germ. Not uncommon in Canada.]

[116.] 165. BYRRHUS PICIPES *Kirby.* –Length of body 3½ lines. A single specimen taken in Lat. 54°.

Body black, covered with short decumbent hairs. Scutellum velvetty-black: elytra with a pair of deep black interrupted stripes terminating in a transverse abbreviated posterior band of the same colour: legs piceous. [As this specific name is preoccupied, Le Conte has named the species *B. Kirbyi*. It is taken in Canada from Quebec to the north shore of Lake Superior].

[117.] 166. BYRRHUS CONCOLOR *Kirby.* Length of body 3 lines. Two specimens taken in Lat. 54°.

This nearly resembles *B. picipes*, but it is much smaller, the prothorax is more distinctly channelled, the elytra have no black band, and the legs are black. [Supposed by Le Conte to be a variety of *Cytilus varius* Fab.]

THE LATE MR. RITCHIE.

The late Mr. A. S. Ritchie, whose loss we have so much reason to deplore, was born at Pettenween, a small town on the coast of Fifeshire. His father, Mr. Robert Ritchie, was a magistrate of that place. Accompanied by his cousin, Mr. David Ritchie, who now resides in Brantford, Ont., he left Scotland for Canada, in 1853. He remained in Montreal one year, during which time he was in the employ of Messrs. Morrison, Cameron & Empey. He then removed to Brantford, where he resided several years, and where he appears to have been very highly respected. Finaliy, he returned to Montreal in 1860 or 1861, where he remained until the time of his death. In the month of May, 1864, he was elected a member of this Society, and from May, 1866, to the present year, he was, as many here well know, an active member of the Council, of which, in 1867 and the present year, he was unanimously elected chairman. He was also a member of the editing committee of the Canadian Naturalist. During the six years of his connection with this Society, he brought before us seven papers, six of which are printed in the Naturalist.

The following are the titles of the papers, and the dates at which they were read :—

March, 1865.—On the structure of insects, illustrated by microscopical preparations.

March, 1866.—On the "Walking Stick" insect, *Spectrum femoratum*.

Nov., 1868.—On the Beetles of the Island of Montreal.

Oct., 1869.—On the White Cabbage Butterfly, *Pieris rapæ*.

Feb., 1870.—Why are insects attracted to Artificial lights?

April, 1870.—Aquaria Studies, No. 1. Oct., 1870.—Aqu. Stu., No. 2.

His favourite study was Entomology, and this he pursued in a philosophic spirit, studying the habits of insects in their native haunts by day, and examining the details of their anatomy under the microscope at night. He was also well acquainted with other departments of Zoology, especially with the infusoria. A little before his decease he was preparing a lecture, "On the Inhabitants of a drop of water," for the young men connected with Erskine Church, and for this Society, a paper on a curious ichneumon parasite of the white cabbage butterfly. He died on the 13th December, 1870, at the early age of 34.

Rev. A. De Sola, LL.D., spoke of Mr. Ritchie, as a most enthusiastic member who had devoted all his spare time to the study of science, which it would be to the advantage of business men to cultivate, and he trusted that many others would follow his example.—CANADIAN NATURALIST.

MISCELLANEOUS NOTES.

POLYHISTOR?—In the September number of the CANADIAN ENTOMOLOGIST, the State Entomologist of Missouri, who is a stranger to me, asserts that "there is something rather incoherent in my articles—that I have committed serious errors," and, furthermore, that I "must not talk of the family of *Hymenoptera*." When I write for the ENTOMOLOGIST, it is not with the intention of leading others astray, or of committing error; and after all consideration, I doubt if my significations would be looked upon as incongruous by the majority of my Entomological colleagues. I have no knowledge of Mr. Riley's definition of "family," and I care not to which of the theories he may have a leaning. I hold my own, and have a perfect right to talk of the *Family* of *Hymenoptera*. In following up this cause, perhaps this Naturalist would have the kindness to correct me with more distinctness, when next he publishes strictures upon my Entomological Notes, and state, for general information, how many families of *Hymenoptera* exist on this continent.

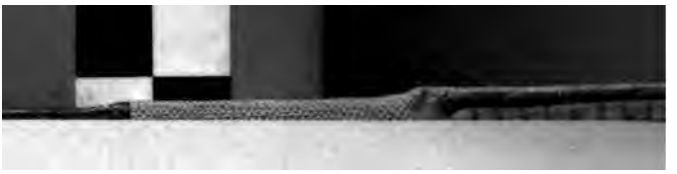
I am told that I "ought to know that *curculionidous* larvæ do not spin silken cocoons," and furthermore, that I "carelessly overlooked the legs" of the larva which I described on page 65, because it happens that inquilinous Lepidopterous larvæ take possession of acorns after they have fallen from the tree. On the 31st of March, the larvæ were of two kinds, and three sizes were found in the acorns of the White Oak in this latitude, and I am not astray in stating that a larva of an unknown Coleopterous insect did spin a cocoon within an acorn.

In the October number of the ENTOMOLOGIST, Mr. Riley expresses his sorrow for having rashly and inconsistently contradicted a matter with which he was not thoroughly acquainted. Having no knowledge of the existence in this country of a silk-spinning snout-beetle, and, as every Entomologist ought to be conscientious, he thought he should be, even at the ninth hour, and discovers good European authority stating that snout-beetles do spin silken cocoons, or at least, close their nidus with some substance resembling silk. In the September number of the ENTOMOLOGIST, p. 118, he tells us that the acorn weevil is *Balaninus rectus* Say, and that it is found in the acorns of one of the oaks in his State. Fortunately, at this juncture, Mr. Pettit, of Grimsby, comes to my aid, and throws additional light on this important inquiry, by the discovery of *Balaninus*

nasicus Say, in the Red oak, and when we search more thoroughly, I have no doubt but additional species will be found attacking acorns produced by other oaks, therefore there are no species that we can define as "*the* acorn weevil." The remarks made by Mr. Riley, at p. 137, No. 7 CANADIAN ENTOMOLOGIST, regarding the descriptions of Say, are gratuitous; for I have studied and compared his descriptions, and found them very accurate.

Mr. Riley appears to rely greatly on the form and color of the rostrum, as specific distinctions of *Curculionidæ*, but I have no faith in such forms alone, but, as in other *Coleoptera*, must look for those distinctions in the permanency of parts and marks on the body. Mr. Riley refers me to the 3rd Missouri Ent. Report, where, he says, I will find that "we do know something of the habits of quite a number of our snout-beetles;" and at page 138, number 7 CANADIAN ENTOMOLOGIST, he says that "we can do very little in classifying them until their habits and variations are better understood." I have not had the pleasure of seeing the said Report, which may contain the descriptions of quite a number of *Curculionidæ*, but it appears curious that in the two principal collections of *Coleoptera* in the United States, viz.: that of Dr. Le Conte, of Philadelphia, and Mr. Ulke, of Washington, the greater portion of snout-beetles were either undescribed or undetermined- at least, they were so, after Melsheimer's Catalogue was published, and I am aware that those in Dr. Le Conte's collection were not worked up in 1864, as in a letter from him in July of that year, he says:- "I regret that my *Curculionidæ* have not been arranged for the past seven or eight years, and therefore. I am not at liberty to name the species, for fear of giving currency to error." In 1863, Dr. Le Conte issued a revision of the latter catalogue in conjunction with materials from his own collection, which is a standard for comparison, and it terminates with the *Elateridæ*. Part II., of said List, will, no doubt, occupy years of hard work, ere it can be placed in the hands of Entomologists with a perfect list of the *Curculionidæ* of this country; therefore, I may conclude by surmising that Mr. Riley has only a vague knowledge of our Northern species. -WM. COUPER.

NEW BUTTERFLIES AT QUEBEC.--The season of 1871 has been marked by the capture, at Quebec, of three butterflies new to the locality, viz.: ***Papilio asterias***, taken at Lorette; *Polyommatus porsenna*, at the Island of Orleans, and an unidentified species of *Melitæa* at the latter place.- G. J. BOWLES, Quebec.



EXCHANGES, &c.

The undersigned would be pleased to open communications with any Entomologist in Canada, United States or England with a view to exchanging specimens. Address JAMES COLWELL, care of A. CHOUN, Kingston, Ont.

THE undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address EDW. L. GRAEF, 40 Court St., Brooklyn, N. Y., U. S.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

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AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. III. LONDON, ONT., NOVEMBER, 1871. No. 10

DESCRIPTIONS OF LEPIDOPTERA FROM ALABAMA.

BY AUG. R. GROTE, DEMOPOLIS, ALA.

CATACLYSTA ROBINSONII *Grote.* ♂ ♀ I refer this species to Lederer's Section C.: veins 8 and 5 of the secondaries present. Primaries bright golden brown. The median whitish grey space is tolerably narrow and well defined; inwardly bounded by the outwardly arcuate white transverse anterior line; outwardly by the white transverse posterior line which is angulated on the m. nervules. Both the lines are a little uneven. From the distinct and regularly arcuate white transverse anterior line to the base of the wing, the surface is entirely golden brown. On the gray median space there is a blackish stain at the extremity of the discal cell, preceded and defined inwardly by a C-shaped white shade line. Outside the transverse posterior line, the wing is terminally dark golden brown, but becomes dark greyish over the median nervules opposite the angulation of the line; the brown colour obtaining again, over the internal angle. A distinct white sub-apical rounded line (following the shape of the external margin, and allowing, at the apex, the brown scales to appear beyond it), is shortly discontinued. Fringes dark grey. Secondaries pale, powdered with black scales, and these are aggregated in a little cluster before the internal margin. Before the external margin the wing is linearly free from the dark scales, and beyond, on the margin, lies a double series of velvety-black dots, between which, and alternating with them, is a row of brilliant scales, the whole not very conspicuous. Beneath, the hind wings are paler, with an incomplete median band; the marginal series of black and scintellate dots is repeated, but the black dots are single. The fore wings are dark greyish beneath, the two median lines dark, and not very distinct, the median space, posteriorly, is stained with blackish, and the white semi-circular mark of the upper surface is distinctly repeated. Apically, the wing is shaded with brown, and here the terminal white line is distinctly repeated. Exp. 18-19 m. m. Coll. Peabody Academy of Science, & C. T. Robinson.

I took a pair of this pretty species in July near Demopolis.

ERRATUM.—The top line on page 126 of this volume should be placed in the same position on page 125.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 166.

LITHOCOLLETIS.

The following species, which have been described by Drs. Clemens, Packard and Fitch, I have not met with. But for the convenience of those who may not have access to the writings of these gentlemen, I condense the following account :—

1. *L. Argentifimbriella* Clem. has been already mentioned at p. 57. It mines the under surface of leaves of the Chestnut Oak, and must resemble *L. caryae-albella* or *L. lucidicostella*. At *p. 57, ante*, it is suggested that *L. querci-albella* Fitch may be the same insect. Dr. Fitch states that it mines the leaves of the White Oak; and other species of the genus mine both the leaves of the White and Chestnut Oaks indifferently. But Dr. Clemens says that *Argentifimbriella makes a tent mine* on the under side, has a *cylindrical larva*, and *pupates suspended in a thin web* in the mine like *L. lucidicostella*. Dr. Fitch describes the larva of his *querci-albella* as being *flat, mining the underside* (which no known flat *Lithocolletis* larva does except *L. ornatella*, which makes *a flat mine*), and as making *a tent mine* (as I understand Dr. Fitch's description), which no known flat larva of the genus does. He also states that it pupates in an oval cocoon (like that of *L. basistrigella*, as I understand his description), and *no known flat larva makes such a cocoon.*

L. basistrigella Clem. makes just such a mine and cocoon as Dr. Fitch describes, and in the same kind of leaves, but the larva is cylindrical, and the imago is not at all like Dr. Fitchs description of his *querci-albella*. Again no known *flat* larva produces an imago at all akin to the group to which *querci-albella* belongs, according to Dr. Fitch's description. All flat larvæ known—at least in this country—produce imagines of some shade of yellow (*Sec. B., ante*), except *Hamadryadella*, which is of a very distinct group from *Lucidicostella*, &c., to which *querci-albella* would belong, as described by Dr. Fitch. He also says that it resembles the European *L. clerckella*, but *L. clerckella* is not now recognised as a *Lithocolletis* at all, but is known as *Cuniostoma scitella*. It seems to me, therefore, that we must await the rediscovery of the species before we can assign it a place among the American species of *Lithocolletis*.

Argyromiges Morrisella Fitch, and *A. Uhlerella* I consider, as already stated, to be only varieties or worn specimens of *Lithocolletis robiniella* Clem., a variety of which, as Dr. Clemens states, mines the leaves of a species of *Lespedeza*.

2. *Argyromiges (Lithocolletis) Ostensackenella* Fitch *(Rep. 5, sec. 333)*, is no doubt a good species, and from Dr. Fitch's description, must resemble *L. ambrosiaella, ante.* Larval history unknown.

3. *L. Fitchella* Clem. *Argyromiges quercifoliella* Fitch.

Pale saffron ; 5 costal and 2 dorsal streaks and an apical spot, but no basal streak. Head and thorax white. It seems to resemble *L. argentinotella* in the arrangement of the costal and dorsal streaks, and it mines the upper surface of White Oak leaves. Larva cylindrical.

At p. 54, *ante*, it is stated that Dr. Fitch has described 7 species; but there was an error in the count. The true number is 6, and that includes his *Anacampsis robiniella, Argyromiges querci-albella, A. Uhlerella*, and *A. Morrisella*, none of which can be considered good species. There only remains, therefore, his *L. Ostensackenella* and *L. Fitchella*.

4. *L. aeriferella* Clem. Larva cylindrical, and mines Oak leaves. Imago reddish-saffron with 4 costal and 3 dorsal streaks, an apical spot but no basal streak. The first thin costal and the first dorsal streak internally dark-margined ; the second dorsal dark-margined by a line curved above.

5. *L. obstrictella* Clem. Larva cylindrical, and makes a tent mine on the under side of Oak leaves. Reddish orange with three silvery fasciæ dark-margined externally. An apical spot, but no basal streak.

6. *L. tubiferella* Clem. The larva and mine have been already described. It mines the upper surface of Oak leaves. It is pale saffron with slightly oblique white fasciæ both dark-margined externally ; no apical spot, nor basal streak.

The following species are named and described by Dr. Packard (*Guide p. 353*), and I am unacquainted with these except from his descriptions, which are necessarily brief. He gives no account of their structure, but all of the three species, differ so widely in the habits of the larvæ and pupæ and in the ornamentation of the imagines, as to suggest great doubts whether there are not correlated structural differences which separate them from *Lithocolletis* pupæ.

7. *L. geminatella* Packard, is said to be dark slate gray without prominent markings, but with a round black spot on the middle of the dorsal

margin (like a *Bucculatrix ?*), and an apical ocellus. The larva is pale livid reddish (unlike any known *Lithocolletis* larva, but not unlike some *Gracillariæ*). It feeds on leaves of Apple and Pear trees *between two leaves, or in a fold of a leaf.* (This is very unlike a *Lithocolletis.*)

8. *L. curvilineatella* Packard. This larva is unknown. The pupa was found in a long slender cocoon, attached to the bark of an apple tree. (This is like a *Bucculatrix*, but not like a *Lithocolletis*). The imago is pale whitish with yellowish scales, with an apical ocellus in the wings, and a roundish spot on the middle of the dorsal margin. (Like a *Bucculatrix*).

9. *L. nidificansella* Pack. is said to be silvery white with an apical ocellus; three oblique golden costal streaks, and spotted with gold below the costa. The pupa is suspended in a thin web, outside of the leaf between its edges, which are drawn towards each other. This is very different from the habit of a *Lithocolletis* pupa.

The two species of Dr. Fitch, these three (?) of Dr. Packard, the seventeen species of Dr. Clemens, and the fifteen species which I have described in these papers, make the total number of described American species of *Lithocolletis* up to this time, thirty-seven.

L. tritæneanella, ante p. 110, is scarcely sufficiently characterized to distinguish it from the European *L. trifasciella* as described and figured by Stainton, *Nat. His. Tin. v. 2.* As compared with Stainton's figure, this species is more golden, the fasciæ are straighter, with much narrower dark margins, and in this species the only dark dusting is a small spot at the apex. Still, if there is much variation, this may be the same species. In *Trans. Lond. Ent. Soc., Sec. 2, v. 2,* is a figure of *trifasciella* not nearly so well executed as Stainton's, but more nearly resembling this species. It, however, has a dorso-apical patch of dusting, which is wanting in this species.

What do Mr. Stainton, Dr. Clemens and others, mean by "the spring brood" and "the fall brood," &c., of *Lithocolletis* and allied genera? I confess I do not know. I know what it means when applied to some insects, because, as to such, there is "a time for all things"—a time when they are found only in the larval state, a time when they are found only in the pupal state, and a time when only the imago can be found. Indeed this seems to be the case with most moths, even with the *Micros.* For instance, many (not all) species of *Gracillaria* are found as moths, only in the fall, or in the spring and fall, and the larva only is found at midsummer. But in the genera, *Lithocolletis, Phyllocnistis, Tischeria, Cemiostoma,*

and *Parectopa* Clem. (which is a *Gracillaria*), which seem to me to be nearly related to each other, I have not yet found it so. For instance, take *L. robiniella* Clem. It hybernates beneath bark, and is found abroad on the wing, early in Spring, (so early that there are no flowers, and I cannot imagine what it lives on) and in Summer. But the mine and larva, are not found until the middle of July, (and then, and always, only in the *older leaflets*; I have never found them in young and tender leaflets). It remains in the larval state, not exceeding three weeks, and in the pupal state not so long. Six weeks will cover the time from the hatching of the egg to the development of the imago, at which period many of the old brood still remain alive; and from that time, until the fall of the leaves in Autumn, the insect may be found in all its stages, and in gradually increasing numbers in all. Many are still in the larval state, when the leaves fall, and doubtless perish. Others survive as pupæ probably; as do other non-hybernating species. *L. robiniella* is the only *Lithocolletis* which I know to hybernate, though I suspect that *L. salicifoliella* also does, from the fact that I have found it abroad late in October. Of the allied genera, all the species of *Phyllocnistis* known to me, winter over as imagines, except *P. liriodendronella* Clem., and, perhaps, that does also. All the others, so far as I know their habits, pass the winter as larvæ or pupæ. They begin to appear sometimes as early as March, usually in April, and towards the latter part of May they begin to oviposit. From the first to the middle of June, the first pupæ are found, and, shortly afterwards, the first imagines, whilst yet their ancestors are still alive; and from that time, until the fall of the leaves, they may be found in constantly increasing numbers, in all of their stages, and the different broods overlap, so that there is no line to be drawn between them.

But, if the phrases "spring brood," "summer brood," &c., only mean that there is a certain number of generations descended from a given pair in one season, then we can only arrive at the number of generations, by breeding them, or *by guesses*, founded on the length of time, passed in the larval and pupal states. I write about one degree south of Dr. Clemens, and I think it probable that there are as many as four here, and certainly not less than three; and the number increases as we go southward. I have taken *L. Ulmella*, or a closely allied species, at Columbus, Georgia, late in November—a month after it had disappeared here. And I have found *Parectopa robiniella* Clem. actively mining Locust leaves at New Orleans in December; and if there is any cessation of its broods there at all, it can not exceed two months.

NOTES ON THE LARVA OF HALESIDOTA MACULATA, *Harris.*

BY W. SAUNDERS, LONDON, ONT.

Three specimens of this larva were taken Sept. 16th, feeding on Oak. Length, 1.30 in.; cylindrical.

Head large, slightly bilobed, black with a faint white streak down the front, as far as the middle, where it becomes forked, a branch going towards each of the palpi. Mandibles black, palpi white at base, tipped with black.

Body above black, thickly covered with tufts of bright yellow and black hairs. On the second, third and fourth segments, the hairs are mixed, yellow and black; those of the second and third segments overhanging the head. From the fourth to the eleventh segments inclusive, is a dorsal row of black tufts, the largest of which are on the tenth and eleventh; the fourth and eleventh segments have also a black tuft on each side, near the base. The hairs on the sides of the body, from the fifth to the tenth segments inclusive, are all bright yellow, while those on the sides of the twelfth and thirteenth, are mixed with black. On the third, fourth, eleventh and twelfth segments, are a few long, spreading, yellow hairs, much longer than those on the other portions of the body.

The under surface, is a little paler in colour, especially between the prolegs; feet black and shining, with faint lines of a paler hue; prolegs pale yellow, faintly tipped with reddish brown.

In a few days after their capture, these larvæ entered the chrysalis state, within a yellowish grey oval cocoon, constructed of silk, interwoven with the hairs of the larva; the perfect insect appeared on the 4th of June following.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 176.)

167. BYRRHUS CYCLOPHORUS *Kirby.* — Length of body 3¼ lines. One specimen only taken.

Body underneath and limbs dull ferruginous, above black with some cinereous hairs intermixed. Antennae piceous: elytra with two deep black subinterrupted stripes, and inscribed in the middle with traces of a

circle formed of pale, or cinereous hairs, common to both. The circle is probably more distinct in recent specimens. [Taken at Grimsby, Ont., by Mr. Pettit, and at Toronto by Mr. Couper; north shore of Lake Superior by Agassiz's Expedition.]

[118.] 168. BYRRHUS VARIUS *Fabr.*—Length of body 2¾ lines. Several specimens taken in the journey from New York to Cumberland-House.

Body underneath black. Head and prothorax bronzed, the gloss obscured by glittering hairs, above the scutellum is a patch of golden ones: scutellum channelled, covered with paler hairs: elytra slightly furrowed, bronzed, with the alternate interstices of the discoidal furrows green-bronzed, spotted with little velvetty patches of black hairs. [Belongs to *Cytilus;* not uncommon throughout Canada.]

[119.] FAMILY HYDROPHILIDÆ.

169. HYDROBIUS FUSCIPES *Linn.*—Length of body 3 lines. A single specimen taken in Lat. 65°.

Body oblong, convex and rather vaulted; underneath black, very minutely and thickly punctured with a pale short decumbent hair planted in each puncture; above slightly bronzed, more conspicuously punctured, naked and rather glossy. Head slightly impressed on each side between the eyes; palpi pale rufous, last joint dusky at the tip: antennae rufous with a black knob: sides of the prothorax with two or three groups of larger punctures: elytra furrowed with thickly punctured furrows, dusky rufous at the sides: legs dark rufous, base of the thighs black. This is smaller than my British specimens, the furrows of the elytra are rather deep, and their sides more conspicuously rufous. [Taken in Canada.]

[120.] 170. HYDROBIUS MARGINELLUS *Fabr.*—Length of body 1⅓ line. Two specimens taken in Lat 54°.

Body subelliptical, convex, minutely punctured, black; above glossy. Palpi and antennae dusky rufous; knob of the latter black: sides of the prothorax, and the anterior margin dusky rufous: elytra with a single furrow adjoining the suture; sides dusky rufous: tarsi rufous.

171. HYDROBIUS MELANOCEPHALUS *Oliv.*—Length of body 2¼—2½ lines. Two specimens taken in Lat. 54°

[121.] Body subelliptical, minutely punctured; underneath black, somewhat hairy with very short inconspicuous hairs, above lurid or dirty yellow, glossy, more conspicuously punctured. Head black with a quadrangular yellow spot before each eye; nose gibbous separated from the

front by a transverse angular line; palpi and antennae dirty-yellow, the latter with a black knob: prothorax with a dark, discoidal, subquadrangular spot, which does not reach the anterior margin: shoulders with a dusky line: tibiae and tarsi dusky rufous.

Var. B. Larger, dusky rufous above, spots before the eyes larger and subtriangular: black spot on the prothorax wider but not so near the anterior margin; shoulders of the elytra without a dusky line. [This and the preceding are European species; Kirby's descriptions of them are not sufficiently definite to enable them to be identified with any of the species described by Le Conte in his "Synopsis of the *Hydrophilidæ* of the United States." (Pro. Acad. N. S., Philada., June, 1855).]

[123.] FAMILY HISTERIDÆ.

172. HISTER PAYKULII *Kirby*.—Length of body 3¼ lines. One specimen taken in the journey from New York to Cumberland-house.

Body black, glossy. Head circumscribed by a rather deeply ploughed furrow; antennæ piceous with a pale knob; mandibles longer than the head: prothorax rather wider behind, seemingly quite smooth, but under a strong magnifier it appears thickly covered with very minute lightly impressed punctures; it is circumscribed on all sides, by a deepish furrow, between this furrow and the lateral margin is another abbreviated one less impressed; elytra besides a distinct marginal furrow have three discoidal subpunctured ones running from the base to nearly the apex; between the external discoidal furrow and the margin is a series of punctures near the apex, representing what is called the marginal furrow, and between the internal one and the suture are the traces of three others, the first just discernible, drawn, but interruptedly, from the base to the apex; the second consisting of three or four punctures near the apex, and the third parallel with the suture, consisting also of punctures, sometimes confluent. and extending from the apex not quite half the length of the elytrum; the surface of the elytra is covered with minute punctures very lightly impressed, so as not to be discoverable except under a good magnifier: the cubit or anterior tibia is armed with three teeth, the last of which appears cleft from its being furnished at the apex with two short truncated transparent bristles, the two other teeth have only one such bristle.

[Synonymous with *H. depurator* Say (Ent. Works ii. 261), a species found in Canada, and taken by Agassiz's Expedition on the north shore of Lake Superior.]

173. HISTER HARRISII *Kirby*.—Length of body 3¼ lines. One specimen taken in the journey from New York to Cumberland-house.

Body black, glossy, thickly punctured, the punctures on the upper-surface being most conspicuous. Head circumscribed; antennæ and palpi nearly of a mahogany colour; mandibles longer than the head; nose slightly impressed: prothorax with two furrows at the lateral margin, both nearly reaching the base, the inner one, as usual, when arrived at the anterior margin, with the corresponding one on the other side forming one furrow surrounding the prothorax on three sides; just above the scutellum is a punctiform impression: the elytra, including the submarginal one, have seven distinct furrows, the two next the suture being anteriorly abbreviated and very short, especially the first; from the base of the first, or external discoidal one, an obsolete furrow runs obliquely towards the submarginal one; the four discoidal entire furrows when arrived near the apex of the elytra are bent towards the suture: cubit piceous, armed with five teeth, the three outer ones obtuse. [Taken at Grimsby, Ont., by Mr. Pettit.]

[125.] LAMELLICORNIA.—FAMILY COPRIDÆ [SCARABÆIDÆ.]

174. ONTHOPHAGUS LATEBROSUS *Fabr.*—Length of body, ♂ 3½ lines; ♀ 3—3¾. A single specimen of the ♀ taken in the journey from New York to Cumberland-house; a ♂ taken in New England by Prof. Peck.

The species of this little interesting genus, remarkable for the great variety of processes resembling horns, that arm the head of the males, are as widely dispersed as those of any genus of beetles; they are to be found in every climate from the frigid to the torrid zone, nor do they increase in size as they recede from the former and enter the latter, for the most minute species are to be found in Southern India, where they abound, while the largest seem to inhabit temparate climates.

♂ Body entirely black, except the hands or anterior tarsi, which are rufous: gloss obscured by hairs. Nose at the apex bent upwards, forming a vertical, triangular, acute tooth; on the vertex are two obsolete transverse ridges: the prothorax is rough with little granules, and anteriorly sends forth a longish wide horn truncated at the end and overhanging the head: the two angles of the apex are elevated, and the space between them is deflexed, and bidentate: the cubits are armed with four sharpish teeth.

The female differs from the male merely in having the shield of the head more distinctly notched on each side, and the apex of the nose rounded and reflexed, but without any triangular horn or tooth; in having two distinct ridges on the vertex, and in having no prothoracic horn, which

is replaced by a transverse emarginate ridge in the middle. [Quite common everywhere throughout Canada; generally found under the droppings of horses or cattle.]

[126.] 175. ONTHOPHAGUS SCABRICOLLIS *Kirby*.—Length of body 4 lines. A single ♀ specimen taken in Canada by Dr. Bigsby.

This is so like the last insect that I felt at first disposed to consider it as merely a variety. The following differences in their character induce me however to consider them as distinct. Not to mention the difference of size, the female of *O. latebrosus* has a distinct notch on each side of the head, of which there is no trace in *O. scabricollis*, the ridges of the vertex of the latter are more elevated, the prothorax is larger in proportion and much rougher, with larger and more numerous granules, and the four teeth of the cubit, which in the former are long and acute, in the latter are shorter and obtuse.

176. TROX ARENARIUS *Fabr.*—Length of body 3 lines. Taken by Capt. Hall in Nova Scotia.

[127.] Body oblong, black, without any gloss. Head covered with cinereous varioles; nose a little reflexed, rounded with a slight tendency to be obtusangular; antennæ ferruginous; prothorax with a wide rather obsolete dorsal channel; sides with two impressions, one near the anterior angle, and the other basilar in the disk; base lobed; lateral margin fringed with ferruginous bristles: elytra slightly furrowed, interstices with each a series of elevations crowned with brown bristles, the elevations of the alternate series are minute; anterior tibiæ with three acute teeth, they are also serated at the base. [An European species, not found in Canada.]

177. PELIDNOTA PUNCTATA *Linn.*—Taken by Dr. Bigsby in Canada, near Lake St. Clair. [Abundant, and often very injurious to the foliage of the grape-vine throughout the Western peninsula of Ontario; it does not occur, however, as far east as Toronto. For description and illustrations, see "First Report on the Noxious Insects of Ontario," Saunders's Report, page 106; or Harris's "Insects injurious to Vegetation." p. 25; Fitch, Riley, Packard, etc.]

[129.] 178. CAMPTORHINA ATRACAPILLA *Kirby*.—Length of body 5¼ lines. Taken in Canada by Dr. Bigsby, and in Nova Scotia by Capt. Hall. [Synonymous with *Serica vespertina* Schonh., a species taken commonly throughout Ontario, and, according to Dr. Le Conte, in the Middle, Southern, Eastern and Western States, as far as Lake Superior. For description *vide* Say's Ent. Works, ii., p. 143.]

Genus DIPLOTAXIS *Kirby*.—Labrum transverse, lanceolate, anteriorly emarginate. Mandibles very short, trigonal, incurved, truncated and concavo-convex at the apex; molary space small, irregular, channelled? Maxillæ very short, incurved, incrassated at the base; apex armed with three short, stout, conical teeth. Labium very short, transverse, entire, separated by a faint line from the mentum. Mentum quadrangular, rather wider than long. Palpi maxillary four-jointed, very minute, cylindrical; second and third joints thicker, equal in length, obconical; last thickest and longest, lanceolate-ovate, acute. Palpi labial three-jointed; first joint obconical; second subcylindrical; third nearly as long as the other two, but scarcely thicker, conical. Antennæ ten-jointed; scape elongato-obconical; pedicel nearly spherical; third and fourth joints conical; fifth and sixth nearly top-shaped; seventh pateriform; the three last forming a short ovate knob.

[130.] Body between oblong and ovate, not hairy. Head inserted, subtriangular with the vertex of the triangle truncated; rhinarium transverse, vertical, widely emarginate; nose transverse, distinct, anterior margin reflexed and subemarginate; no distinct postnasus or afternose; canthus septiform, cleaving: prothorax transverse with an anterior sinus of its whole width to receive the head: scutellum short, triangular, somewhat rounded at the vertex: podex and part of the penultimate dorsal segment of the abdomen uncovered: legs thus located ⁝⁝; cubit tridentate; tarsi filiform, slender; claws bipartite, the interior lobe the shortest and widest, and very obtuse; the exterior very slender and acute.

179. DIPLOTAXIS TRISTIS *Kirby*.—Plate v., fig. 3.—Length of body 5—5½ lines. Several specimens taken in Lat. 54°. Taken also in Nova Scotia by Capt. Hall.

[131.] Body dark chestnut, more or less grossly punctured above and below. Head thickly punctured with a pair of impressions between the eyes; nose subemarginate; antennæ and palpi rufous: prothorax thickly punctured, slightly impressed at the four angles: scutellum impunctured: elytra rather paler than the head and prothorax, with nine rows of punctures, viz., a single one at the suture, four arranged in pairs at the disk, and four in the sides; the interstices between the rows are also irregularly punctured; the four posterior tarsi, especially the intermediate pair, are longer than the tibiæ.

OBS. In more recently disclosed specimens the body is often entirely pale-chestnut and sometimes rufous. [Common throughout Ontario. "Middle States and Lake Superior, not rare." *Le Conte*.]

[132.] 180. RHIZOTROGUS FERVENS *Gyll.*—Two specimens taken in Lat. 54°; a variety in Canada by Dr. Bigsby. [Synonymous with *Lachnosterna fusca* Frohl; the common May Beetle, or Cockchafer, of Canada. "A very common and, through Atlantic America, widely extended species, embracing several races, to which, however, no definite characters can be given." (Le Conte). For description and figure see Harris's Injurious Insects, page 30.]

[133.] 181. RHIZOTROGUS DRAKII *Kirby.*—Length of the body 9¼ to 11¼ lines. A single specimen taken in the journey from New York to Cumberland-house. Varieties B and C, by Mr. Drake in Massachusetts.

This species is extremely similar to the last, it differs principally in having the sides of the scutellum more thickly punctured, the ridges of the elytra, except the sutural one, are scarcely discoverable, and the podex larger and rounder at the apex: the tarsi also are longer in proportion: the knob of the antennæ in all the specimens is longer.

B. Much larger, and the elytra appear somewhat more thickly punctured, but it is scarcely distinct.

C. Like A, but the ridges of the elytra are all discernible. [A race of the preceding species.]

DESCRIPTION OF A SPECIES OF AGROTIS FROM CANADA.

BY AUG. R. GROTE, DEMOPOLIS, ALA.

Agrotis repressus, Grote. Hind tibiæ with two, middle tibiæ with one pair of spurs; fore legs unarmed. Palpi prominent, porrect; 3rd joint elongated. Body somewhat flattened, much as in *A. clandestina.* Squamation lustrous, silky. Unicolorous pale testaceous or greyish-brown. Fore wings and thorax concolorous; the first are without markings, except a short dark dash on the cell in place of the orbicular, and two similar superposed marks at the extremity of the cell, in place of the reniform spot. Three pale ante-apical dots on costa. Veins subobsoletely marked with darker scales. Secondaries pale with a testaceous tinge, darker shaded outwardly. Beneath paler, powdered with greyish and brownish scales; faint traces of discal marks. Caputal scales dark testaceous. Antennæ simple. Exps. 35 m. m. Length of body, 15 m. m.

Appears nearest allied to *A. brunneicollis* and *A. clandestina.* Smaller than the latter, without the lateral abdominal dots, and with longer palpi and obliterate ornamentation of the primaries above.

Lent me, with chrysalis, by Mr. William Saunders, and ticketed: "from larva, 135;" together with specimens of *A. clandestina*, ticketed: "from larva, 131." This species reminds me of *Amphipyra inornata*, but it cannot be the same, although I fancy, in certain lights, that the hind wings are warmer tinted within vein 2. From recollection of the type in Mr. Saunders's collection, I cannot consider *A. inornata* a variety of *A. pyramidoides*, as has been suggested.

NOTES ON THE LARVA OF AGROTIS DEPRESSUS, *Grote*.

BY W. SAUNDERS, LONDON, ONT.

In the previous paper Mr. Grote describes a new species of *Agrotis*, under the name of *depressus*, which was sent him from my collection some time ago; he also refers to *Agrotis clandestina* as received from me. This latter species was first determined for me by Mr. C. V. Riley, of St. Louis, Mo., and subsequently by Francis Walker, Esq., of the British Museum, Mr. Riley has figured and described the larva in his first report on "The Noxious Insects of Missouri," p. 79, and my own description was published in the present volume of the CAN. ENT., p. 35.

I now give a description of the larva of *Agrotis depressus, Grote*, which I have reared for two summers past, having found it feeding on the grape vine. It is a yellowish green larva sparingly covered with very fine brownish hairs. Length 1.25 to 1.40 inches, nearly cylindrical.

Head rather under medium size, somewhat flattened in front, slightly bilobed: green, with a few short fine hairs. Mandibles tipped with dark brown.

Body above, yellowish green, a little paler between the segments, with a dorsal and two lateral stripes of yellowish white, the lower one rather most prominent, running through the spiracles and extending posteriorly nearly around the anal lid. On each segment are several minute whitish dots, slightly raised, but scarcely visible without a magnifyer, from each of which arises a single fine hair. Spiracles yellowish, ringed with black.

The under surface is of a deeper shade of green than the upper; feet and prolegs green, faintly tipped with brown.

This larva may be found full grown from the 10th to the 25th of June, the moths appearing early in July.

MISCELLANEOUS NOTES.

NEW MODE OF ATTRACTING LEPIDOPTERA.—We beg to direct the attention of our readers to the following new method of attracting Lepidoptera, which appears to be wonderfully successful in France, and trust that it will be tried next year in this country. We translate the account from *Les Petites Nouvelles Entomologiques* No. 37, page 148:—"Among the various methods employed in the collection of Lepidoptera, the most successful, both as regards the quantity and freshness of the specimens which it enables one to procure, and as regards the number and rarity of species—the most successful, we say—is that which consists in employing some bait for the attraction of Lepidoptera. Everyone knows, indeed, the mode of pursuit indicated by the title of "sugaring" *(miellee)*, and no one is ignorant how very productive it is. But this method is not the only one which consists in the employment of baits, and it is by no means the most productive. There is one other in particular, which is only known to some Entomologists, who are unwilling to divulge, even to their friends, the secret of the richness of their collection. One of our colleagues tells us that he had seen this mode of collection practised for some years, but without being able to obtain the secret of it. He saw a large quantity of nocturnal Lepidoptera taken in this way, and among them some rare species.

"This plan consists in suspending to trees, by means of twine, some apples half dried in an oven, known in commerce by the name of '*pommes au four, pommes tapees*,' etc. These apples diffuse a strong odour of *Reinette*, an abnormal odour of some fruits in this state of desiccation. From twilight, the Lepidoptera came hovering in swarms about this bait, which, after a little while, was literally covered with Noctuadæ, Geometers, etc., in a complete state of immobility. The collector had nothing more to do than to plunge the apple into a wide-necked bottle, charged with Cyanide of Potassium to kill them. He visited in this manner all his baits, and collected in half an hour more than he had collected in a week by means of 'sugaring.'

"Some Entomologists, having discovered the ingredient by means of which they communicated this abnormal odour to apples, and being more desirous of benefitting their colleagues, and aiding the progress of science, than of preserving a monopoly of certain captures, have communicated to us the result of their investigations, and we are happy to make it known

to our readers, in spite of the reproach of indiscretion which some will apply to us.

"It suffices to dip these apples into *Nitric Ether*, and then to suspend them, by means of twine, to the branches of trees at a convenient height for the ready introduction of the insects into the bottle of Cyanide. As in the case of 'sugaring,' the best places are forest glades, edges of woods, sides of roads adorned with trees or hedges, etc.

"Lepidoptera are so much attracted by the odour of this Ether, that they attach themselves to the apple, and suffer themselves to become completely intoxicated by the vapour, remaining in such a perfect state of immobility as to permit, without difficulty, the introduction of the apple into the bottle, and the collection of Lepidoptera in a most perfect state of freshness."

In the subsequent number of *Petites Nouvelles Entomologiques* (Oct. 15, 1871), we find the following result of experiments with this mode of attracting moths :-

"M. Fallon has tried, in the forest of Senart, the mode of collecting by means of Nitric Ether, of which we spoke in our last number, and has communicated to us a curious observation on the matter. He tried this method three days running, and on the third day he saw, in twenty minutes, his baits literally covered with moths. But the first day not a single moth came, and the second day he scarcely saw any. This shows Entomologists possessed of little patience, whom want of success at first might discourage, that ill-success may be accidental.

"M. Fallon conjectured that the cause of the absence of moths during the first and second days of his trial, might be attributed to the proximity of vines, and the maturity of the grapes, which drew away the moths. This appears to be undoubtedly the case, though it is not perhaps the only cause; we should as readily ascribe the fact, in part, to a too great abundance of Ether vapour during the first days. Indeed, the vapour of Nitric Ether, sufficiently diluted, has a very decided odour of *Reinette*, but when it is in large proportion, the Ether character of the odour predominates too much, and it has but slightly the odour of *Reinette*. In this condition, Nitric Ether can have but few attractions for moths."

INQUILINOUS MOTH LARVA IN OAK GALLS.—I have lately bred the moth from the little *Tineidous* larva, referred to on page 119, as infesting acorns injured by a pip-like gall. It is a little speckled gray species belonging to the genus *Gelechia*, and which I had previously bred from various other oak galls, and especially from that of *Cynips q. centricola*, O.S.

This little moth may possibly be one of Clemens's species, but on comparing it with the European *G. geminella*, Linn., in Mr. Stainton's collection, I found it so very similar that I have no doubt of the identity of the two, especially as their species is said to breed from Oak buds. It may, I think, safely be added to the list of insects common to both continents. It so closely resembles the well known *Tinea granella*, Linn., that the two, upon a casual glance might easily be confounded. The larvæ of the two species differ materially, however. That of the latter is a very general feeder, and I have even bred it from the dry corks of bottles containing poisonous substances; it is of a uniform dirty-white, or tallow colour, the head with dark-brown jaws, and its brown border showing plainly through a semi-transparent honey-yellow cervical shield. That of the little *Gelechia*, on the contrary, is deep carneous and more pilose, and though the head and shield are of the same honey-yellow colour, the latter has darker posterior and lateral margins.--C.V. Riley, St. Louis, Nov. 1, 1871.

Destruction of the Walsh Cabinet in the Chicago Fire. We have no reason to suppose that the great Chicago fire consumed any considerable number of noxious insects, with the exception of that very familiar and domestic species known, in scientific language, as the *Cimex lectularius*. If these had been the only insects destroyed, resignation would have been an easy virtue. But, as if it were ordained that no kind of interest should escape grief and loss from that great calamity, so the science of entomology was put under heavy contribution, by the destruction, not only of many small amateur collections of insects, but also by the ruin of the large collection belonging to the Chicago Academy of Science, and over and above all, in value and importance, was the admirable cabinet of insects purchased by the State from the heirs of the late Benj. D. Walsh, of Rock Island, and which had been deposited in the Academy for safe keeping. The value of this collection consisted not only in the large number of species represented, but still more in the scientific accuracy with which they were labelled and classified. About a tenth part of this cabinet, which happened to be at the residence of the writer, consisting mostly of duplicates of Coleoptera and Lepidoptera, which had been set aside for the Industrial University, is all that is left of this famous Cabinet. When we consider the long years of patient toil and research of which this cabinet was the result, the thought of its irrevocable destruction becomes too painful to be dwelt upon, especially by the professed entomologist, to whom this cabinet was invaluable for purposes of reference.—*Prairie Farmer*.

NOVA SCOTIAN HYMENOPTERA.—In a collection of Nova Scotian Insects, entrusted to me by J. Matthew Jones, Esq., of Halifax, Nova Scotia, are the following species, which Fred. Smith, Esq., of the British Museum, has kindly named. I hope, shortly, to forward a list of additional species :—

Allantus Zona ? Klug.
Ammophila urania, Klug.
Vespa arenaria, Fabr.
Vespa borealis, Klug.
Odynerus albophaleratus, Sauss.
Sphecodes dichroa, Smith.
Megachile obtusa, Smith.
Nomada Americana, Kirby.
Andrena vicina, Smith.
Halictus parallelus, Sauss.
Bombus vagans, Smith.
" *terricola*, Kirby.
" *fervens*, Fabr.
" *ornatus*, St. Farg.

Nov., 1871. F. WALKER.

PIERIS RAPÆ PARASITE.—It will doubtless be an interesting item of intelligence to many of the readers of the *Naturalist*, that the parasite, so anxiously looked for, as the only hope of preserving the cabbage crop of our country from the destruction threatened it by the ravages of *Pieris rapæ*, has already entered upon its labours, and in so efficient a manner as to promise immediate beneficial results.

During the latter part of September, I was informed that a number of chrysalids of *P. rapæ*, which had been collected by a gentleman in this city, with a view of obtaining specimens of the imagines for drawing, instead of disclosing the butterfly, gave out a number of small flies from each. Some of them having been brought to me in compliance with my request, I was delighted to find them to be of the genus *Pteromalus* which includes so many of our valued parasitic friends, and probably of the species which has been found so serviceable in Europe, in destroying the several cabbage butterflies there existing—viz., the *Pt. puparum* of Linnæus.

From the close resemblance which many of the *Pteromali* bear to one another, it is not safe to assert positively that we have really been favoured with the importation of the European parasite, to aid in the work of subjugation of the European pest, but should further examination prove this to be the case, it will be not only a most interesting event in its scientific aspect, but also in the pecuniary results which must necessarily follow it.

In another number, I may give your readers the observations—quite limited, I regret—which I have been able to make on this welcome parasite.—J. A. LINTNER, *N. Y. State Museum of Nat. Hist.*

[We have also raised this parasite in considerable abundance, and also received specimens from Vermont. We have likewise reared a Dipterous parasite from the cocoons. EDS.]—*American Naturalist.*

VARIA FROM *Petites Nouvelles.*—The collections of Coleoptera (Longicorns and Anthribidæ) of the learned author of Geneva, Prof. Lacordaire, now form a part of the Museum at Brussels.—The numerous collection of Curculionidæ of M. A. Deyrolle is now the property of the Philadelphia Museum. However, the types of Lacordaire, A. Deyrolle, M. Jekel, etc., which are deposited in this collection, as well as of the numerous series of species which compose it, will be placed by M. Agassiz at the disposition of Entomologists in cases of serious need. [Query by ED. C. E.:—Is this collection in the Museum of Comp. Zool. at Cambridge, Mass., or in that of one of the Societies at Philadelphia? Perhaps some American Entomologist can inform us.]—During the siege of Paris, Dr. Boisduval, although much engaged every day in attending the sick and wounded, nevertheless continued his work upon the Sphinges; he laboured ardently upon it during the whole continuance of the siege, in spite of the shells and projectiles which exploded all round his house, and fell upon the Val-de-grace and the Pantheon, the tremendous concussion of which shattered the glass of his cabinets! This work, now completed, will fill up one of the gaps in the *Suites a Buffon*, and will form the fourth volume of the Natural History of Lepidoptera. It will include the Sphinges, Castnidæ and Agaristidæ, and will be published on the same plan as the first volume, which treats of Papilios, Pierides, etc. The learned doctor intends to continue his work till he completes the remaining volumes.

ENTOMOLOGY.—Mr. Roland Trimen, F.L.S., F.Z.S., read a note on a curious South African grasshopper, *Trachypetra bufo*, White, which mimics with much precision the appearance of the stones among which it lives.

He commenced by observing that some tendency existed to separate too widely those cases of mimicry where one animal imitated another from those in which an animal closely resembled either some part of a plant or some inorganic object; and expressed the opinion that these two sets of cases were wholly one in kind, the evident object in all being the protection of the imitator.

Describing a visit paid to the vicinity of Grahamstown in search of this insect, he observed that it was a work of considerable difficulty to distinguish the grasshoppers from the stones, and he was engaged for half an hour in careful search over a known station of the species before discovering an example. He noted the further most interesting fact, that, in certain spots (often only a few square yards in extent) where the stones lying on the ground were darker, lighter, or more mottled than those generally prevalent, the Trachypetra found among such stones varied similarly from the ordinary dull ferruginous-brown colouring in imitation of them.

It was pointed out that the close imitation of the stones was mainly effected by the modification of the dorsal shield of the prothorax, which is, with the whole thorax, much flattened and widened, and is further much produced posteriorly, and has its surface roughened or granulated in close resemblance to the surface of the stones.

In conclusion, he called attention to the bearing of the case of this insect on the question of the origin of species; and in putting the alternative whether the peculiar station of the Trachypetra had been specially prepared for it immediately before or simultaneously with the creation of the insect, or whether, on the contrary, the insect had been very gradually modified by natural selection in imitation of the stones for the purpose of concealment, he expressed his decided opinion in favor of the latter hypothesis.

Specimens of the insect were exhibited in association with some of the stones among which they were captured, and the very close resemblance between stones and insects excited general remark. Mr. Trimen observed that in nature the mimicry was more effective, the colours of the dead insects having faded considerably, and the shrinking of the abdomen having caused the hind legs to be much more apparent than was the case in living examples.—*Nature*.

NEW ENTOMOLOGICAL BOOKS.—The 14th fasciculus of Mulsant's "Opuscula Entomologica" is just published. The 3rd volume of the "Natural History of the Hemiptera of France" will be ready in a few days, and will contain four tribes. M. Mulsant has published the new edition of his "History of the Lamellicorns of France," as well as the 1st part of the "Staphylinidæ." A new edition of the "Iconography and Natural History of Larvæ of Lepidoptera," by M M. Duponchel and Guenee, is about to be issued:—the work gives descriptions and figures of a great number of the larvæ of European Lepidoptera, of course including English species; these figures are contained in ninety-three plates, excellently coloured: the work is published in forty fasciculi, at one franc each. Of the Iconography and Description of unpublished Lepidoptera of Europe, by P. Milliere, twenty-five fasciculi have been published, and these contain more than a thousand descriptions of larvæ, pupæ and perfect insects, with the plants on which the larvæ feed, and other details of their life-history; the work is worthy the support of all lovers of the science; nothing can exceed the delicacy and finish of the figures.—*Newman's Entomologist.*

EXCHANGES, &c.

The undersigned would be pleased to open communications with any Entomologist in Canada, United States or England with a view to exchanging specimens. Address JAMES COLWELL, care of A. CHOUN, Kingston, Ont.

THE undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address EDW. L. GRAEF, 40 Court St., Brooklyn, N. Y., U. S.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

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AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. III. LONDON, ONT., DECEMBER, 1871. No. 11

NOTES ON SAMIA COLUMBIA, *S. I. Smith.*

See Frontispiece, Fig. 37.

BY G. J. BOWLES, QUEBEC.

This beautiful moth was discovered by Professor S. I. Smith, at Norway, Maine, and described by him in the Proceedings of the Boston Society of Natural History, Vol. IX., March 1865. It is nearly allied to the well known *Samia Cecropia*, but differs therefrom in being slightly smaller, and in the colouration and markings, as well as in the form of the cocoon and appearance of the larva. It may, therefore, be regarded as a well established species. I have been so fortunate as to obtain a specimen at Quebec, and can therefore add this moth to our list of Canadian Bombycidæ.

The species is evidently rare in this vicinity. I have met with it only three times, and have not heard of its having been taken by any other Quebec collector. In August, 1864, I captured a full grown larva of this moth, crawling along a fence, in search of some place in which to make its cocoon. It closely resembled a Cecropia caterpillar in size and general appearance. Thinking it, therefore, to be a larva of that species, I did not take notes at the time; though on a close examination I could not quite reconcile the colour and arrangement of the tubercles with the description of *S. Cecropia* given by Morris. The principal difference (as far as I can remember), was in the number of red warts with which the larva was ornamented, *S. Columbia* possessing *more* than the other species. As Professor Smith has never seen a specimen, our knowledge of the early history of the moth must remain defective, until some happy bug-hunter discovers the caterpillar, and gives us a detailed account of its beauties. I may add that *S. Cecropia* has not yet been taken at Quebec, though it is found at Lotbiniere, about forty miles west of the city. The larva above mentioned duly spun its cocoon, which was at first of a whitish colour, but in a few days gradually turned to dark brown, and then was exactly similar to the cocoons I afterwards found. The moth died in the chrysalis state, owing, perhaps, to the presence of parasites.

Two years afterwards, I found another cocoon attached to a twig of thorn *(Cratægus)*, but it was full of large parasites, all dead in the pupa. In the fall of 1867, Mr. Couper informed me that he had seen a Saturnian larva spinning up on a gate-post just outside the city, and on examining the place, I discovered a cocoon, which, in the following May, produced the moth, a female, *Samia Columbia*, from which the accompanying drawing was made.

The food-plants of the species are stated by Prof. Smith to be *Nemopanthes Canadensis* and *Rhodora Canadensis;* and perhaps *Kalmia angustifolia*, the maple and the larch. From the situations in which I found the larva and cocoons—on dry and cultivated ground—I think it may also feed on other plants, as none of those mentioned, except the maple, were within accessible distance. *Rhodora Canadensis*, its favorite food in Maine, grows abundantly in an excellent hunting-ground for entomologists—the "Gomin Swamp," a large mossy tract of land about two miles from Quebec. I made several visits to this locality last Spring, and searched the *Rhodora* carefully for cocoons, but did not find any. Perhaps some Western collector may be more fortunate with this plant in his own neighbourhood. The Rev. C. J. S. Bethune states that it is common in rear of Toronto.

The rarity of the moth is no doubt partially due to the fact, that the species is attacked by several parasites. Prof. Smith mentions that out of more than twenty cocoons, he succeeded in obtaining only three perfect insects, nearly all the rest having been destroyed by ichneumons and other enemies. Two species of these have been described in Prof. Smith's paper, by Dr. Packard, as new, under the names of *Cryptus samiæ* and *Cryptus Smithii*. It is likely that the larvæ are equally subject to these attacks in Canada, as one (perhaps two) of the three cocoons I obtained failed to produce the moth from this cause.

Prof. Smith has kindly sent me photographs of the moths, cocoon and chrysalis described by him, so that all doubt is removed as to the identity of my specimen with his. I add his descriptions, to make these notes complete:—

"Male. Antennæ black, and broadly pectinated. Palpi dark maroon brown. Thorax with a white band before; upper side dark maroon, with a short grey band behind; beneath black; the legs also black, slightly tinged with brownish towards the extremities. Abdomen annulated with alternate black and dirty white.

"Above, *Primaries* with a greyish-white band near the base, extending from the inner nearly to the costal border, and enclosing a reddish-brown patch at the base. The middle area of the wing is dark brown, tinged with reddish towards the centre, and contains a triangular white discal spot, bordered on the side toward the base with black, and on the other sides with greyish-brown. There is a narrow white transverse band, wider toward the inner border, between the middle and outer areas. A sinuous black line, on a clay-coloured ground, crosses the posterior border. Near the apex there is a round black spot, containing a bluish-white crescent, with its horns toward the outer border; between this and another small oblong black spot at the apex, there is a white line in the form of a W, with the upper side toward the outer border. A space along the costal border, extending from this zigzag line almost to the middle area, is bluish white, growing darker and more indistinct as it approaches the transverse band. A short band between the middle area and the greyish outer border, extending from the inner border a third of the way across the wing, is dark greyish-brown, becoming lighter as it leaves the inner border. *Secondaries* with a small dirty white spot on the shoulder, and the anterior border just edged with the same. A white transverse band similar to the one on the primaries. The space between this band and the base of the wing is dark brown, with the discal spot large and white; the outer border is margined with clay-colour, bounded on the inside by an arcuate black line. Just inside of this line, there is a band of oblong black spots on a greyish ground; the space between this band of spots and the transverse band is occupied by a wide greyish-brown band.

"Beneath, the markings of the upper side are repeated; but all the reddish tints are wanting, so as to leave the ground colour of the wings black, intermingled with whitish scales. The discal spots are bordered with black.

"Female. The antennæ are less broadly pectinated than in the male, and all the colours less intense. Discal spots of the primaries almost obsolete; being only short lines bordered with black, and parallel to the transverse band. Discal spots of the secondaries much smaller than in the male, and more rounded.

"Expanse of wings, ♂ 4 in.; ♀ 4.9 in.

"The cocoon is double; the outer coat being an oblong oval, pointed at the upper end; dark ashy brown, with little patches of silvery silk, and with an irregular, knobby surface. The inner cocoon is of a regular oval

at both ends, and closely woven upon the outer coat, except at the upper end, where the point of the outer cocoon extends above the inner one. Length of cocoon, 1.80 to 2.15 in.; diameter .6 to .8 in. They are attached longitudinally to twigs. The imagines appear at the end of May.

"This species differs materially in colour from *S. Cecropia*. The male has the antennæ, palpi, thorax and legs much darker. The short grey (or whitish) band on the hind part of the thorax is not found in *S. Cecropia*. The discal spots of all the wings are white instead of dull red with a white centre. The transverse bands of both pairs of wings are white, instead of dull red bordered internally with white. It wants the broad white band so conspicuous on the anterior border of the secondaries of *S. Cecropia*, and also the reddish tints and markings near the apices of the primaries.

"The female differs from that of *S. Cecropia* in having the palpi, legs and abdominal rings dark brown, or almost black, instead of dull red. The discal spots of the primaries are linear, obscure and parallel to the transverse band, instead of broad, conspicuous and parallel to the costal border. The discal spots of the secondaries are small, and almost round, instead of large and somewhat triangular. As in the male, it has the white on the hind part of the thorax, and wants the white on the anterior border of the secondaries, and also the red on the apices of the primaries, on the discal spots, and on the transverse bands.

"The cocoon differs greatly from that of *S. Cecropia*. It is much smaller and of a more regular form. It is dark brown, approaching black in some places, with silvery spots; instead of uniformly light brown. The inner and outer cocoons are so closely woven together, except at the very top, as to be separated with difficulty; while in *S. Cecropia* they are separated by quite a space filled with loose silk."

Since the publication of Dr. Packard's "Synopsis of the Bombycidæ of the United States" in 1864, the genus Samia (Hubner) in America has been restricted by Mr. Grote to a Chinese silkmoth, the *Samia Cynthia* of Linnæus, which has been introduced into the United States, and has become acclimatized there. Mr. Grote has erected the new genus Platysamia (Broad Samia) for *Cecropia*, *Columbia* and *Californica* (the *Saturnia Euryale* of Boisduval, found in California). By this revision, therefore, the species under consideration will in future bear the name of *Platysamia Columbia*, S. I. Smith.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 185.

LEUCANTHIZA?

L. Saundersella. N. sp.

Palpi white: face opalescent or silvery, according to the light: antennæ maroon-brown, silvery towards the apex: tuft maroon-brown: thorax of a shining metallic lustre, in some lights opalescent: a streak of the same hue crosses the extreme base of the wings, is continued for a short distance along the dorsal margin, and thence curves obliquely across the wing again to the costal margin, enclosing a maroon-brown patch upon the costa, and being narrowly margined behind with dark maroon, beyond which the wing is bright golden to the apex. There is a short oblique somewhat curved brilliant metallic streak upon the costa, about the middle, pointing forwards, and nearly reaching the fold, with a maroon-brown dark margin extending from the costa before it to the costa behind it; and a second smaller straight costal streak, of the same hue, similarly dark margined, placed at the beginning of the costal ciliæ. Another straight streak of the same hue extends from the middle of the dorsal margin to the beginning of the dorsal ciliæ, with a maroon-brown margin extending around it, and continued as a narrow band entirely around the apex of the wing, at the base of the ciliæ, to the second costal streak; ciliæ silvery gray. *Alar ex.* ¼ inch. A single specimen taken in Kentucky in August. Larva and food plant unknown.

I have named this pretty species in honour of Mr. Wm. Saunders, of the CANADIAN ENTOMOLOGIST.

The markings of the head, thorax and basal half of the wings, must be very similar to those of *Leucanthiza amphicarpeæfoliella*, Clem., *Proc. Acad. Nat. Sci. Phila.*, 1859, but those of the dorsal and apical portions seem to be very different. Those of the anterior portion are very similar also to those of *Lithocolletis ornatella, ante*, which, as before stated, seems to obliterate the differences between these two genera, except as to the neuration of the wings, as to which, the species of *Lithocolletis* differ somewhat among themselves. I, therefore, doubt whether *Leucanthiza* can be maintained as a distinct genus. Having but a single specimen, I have not examined its neuration. But from its evidently strong resemblance to the only other described species *(L. amphicarpeæfoliella)*, I place it for the nonce in that genus.

PHYLLOCNISTIS.

The species of this pretty genus of snow-white moths may be distinguished from the white species of *Lithocolletis* by the smooth head and the usually smaller size. Otherwise, they resemble each other strongly. The resemblance between *L. Clemensella* and *P. vitifoliella*, and between *P. liriodendronella* and *L. caryæ-albella*, is very great. The larvæ also, notwithstanding that they are apodal, resemble the young *cylindrical* larvæ of *Lithocolletis* in general appearance.

The mine is a long narrow winding line like the track of a small snail, and it pupates in a *nidus* at the end of the mine on the edge of the leaf.

1. *L. vitifoliella. N. sp.*

Glistening snowy white, the forewings tinged with golden towards the apex. Behind the middle of the wing is a narrow oblique blackish costal streak, and behind it again another small straight one, opposite to which is a small straight dorsal one. At the tip is a circular black spot, and before it on the costa are two straight black streaks. At the tip of the wing are two blackish diverging lines in the ciliæ, with another also in the ciliæ beneath the apical spot, and nearly adjoining the blackish hinder marginal line. Ciliæ silvery. Hind wings and ciliæ silvery white. *Alar. ex.* less than ¼ inch. The larva mines the upper surface of Wild Grape leaves from May to October. Kentucky. Wisconsin.

Since the above was written, I have seen the remarks of Dr. Clemens, in *Proc. Ent. Soc. Phila.*, vol. 1, p. 135, under *Lyonetia*, in which he describes a mine in leaves of grape vines, in which the parenchyma is entirely eaten out, and the frass centrally deposited, in both respects differing from the mine of *P. vitegenella*, which resembles a snail's track. Dr. Clemens did not succeed in rearing the imago, but thought it was distinct from *P. vitegenella*, though closely resembling it. On examining my herbarium specimens of the mined leaves, I have no doubt that Dr. Clemens had the mines of this species before him. In Kentucky it is as abundant as *P. vitegenella*, all through the summer, in all of its stages, and can be found in winter abundantly hybernating under the loose bark of Hickory trees, and in similar situations in company with *P. vitegenella*, and occasionally *P. ampelopsifoliella*. It seems to bear nearly the same relation to *P. vitegenella* that *Lithocolletis Clemensella* does to *L. lucidicostella*.

2. *P. vitegenella*, Clem. *Proc. Acad. Nat. Sci. Phila., 1859, p. 327.*

Differs from *P. vitifoliella* only in the following respects: The antennæ are blackish above; there is a pale semi-oval blackish spot on the dorsal margin of the wings, not far from the base; the second costal streak

unites with the opposite dorsal one, forming a narrow fascia. *Alar ex.* less than ¼ inch. Very abundant in its mine, on the upper surface of grape leaves, as larva and pupa, from May to November. Imago from June to November, and hybernating under bark. Wisconsin, Pennsylvania and Kentucky.

3. *P. ampelopsiella. N. sp.*

Glittering snowy white wings, slightly golden towards the apex. Antennæ, except near the base, *suffused with pale fuscous.* A pale black spot on the dorsal margin of the wings, not far from the base. *An indistinct blackish median longitudinal line on the thorax. A very distinct oblique black basal streak above the fold, beginning at the base of the costa, and parallel to the fold.* Behind the middle of the costa is an oblique costal black streak, which is produced along the costa. Behind this is a black line curving from the costa to the inner margin. At the tip is a circular black spot, and before it, on the costa, are two straight black streaks, *the posterior of which is the longest, passing before the apical spot nearly to the inner margin.* At the tip are two black diverging lines in the ciliæ, and another also in the ciliæ beneath the apical black spot, and nearly joining the black hinder marginal line. *Abdomen and legs tinged with pale golden.* Ciliae silvery. *Alar. ex.* less than ¼ inch. Kentucky. Common.

The points in which it differs from *P. vitegenella* are indicated by the italics, and its dark markings are more distinct.

The larva mines the under surface of leaves of the Virginia Creeper *(Ampelopsis quinquefolia)* through the summer, and until the fall of the leaves. Usually, at some point of the mine, it is spread out, assuming the appearance of a white blotch, and thus differs from the mines of the other three species. The parenchyma is not all eaten out, and the mine is not transparent, thus resembling that of *P. vitegenella* and *P. liriodendronella*, and differing from that of *P. vitifoliella.*

4. *P. liriodendronella*, Clem. *Proc. Ent. Soc. Phila., v. 2, p. 13.*

This is the only other described American species. It mines the leaves of the Tulip Poplar *(Liriodendron tulipifera)*, but it is not, as Dr. Clemens supposed, confined to the upper side of the small terminal leaves. It mines both surfaces, without regard to the size of the leaf. And there is a mine, which I believe to be the same, upon both surfaces of the leaves of *Magnolia glauca*, and upon the upper surface of those of *M. grandiflora*, and probably upon all of our native *Magnoliaceæ*, though I have never observed it on the Japanese *M. purpurea.*

It is a little larger than either of the preceding species having an *alar ex.* of fully ¼ in. It is glistening snowy-white, with a pale golden basal streak from the base of the costa above the fold, and which unites at a somewhat acute angle with the first costal streak. The wing is more golden than the preceding species, and the streaks are rather wider apart.

It is not very common in Kentucky, although its food plant is abundant; and it is rather difficult to rear in confinement, probably because the leaves dry so rapidly.

There is another species, the imago of which is unknown. The larva mines the leaves of an unknown weed, growing in small tufts like a plantain, the leaves of which are deeply lobate, occurring abundantly all through the Gulf states, especially in damp woods. The larva is very abundant, and its anal segment very long. Mine, like that of *P. vitifoliella.*

TISCHERIA.

This genus differs from *Lithocolletis* in the much plainer colours of the imago, and much shorter antennae, which in the males are ciliated. The maxillary palpi also are developed, though small and scarcely perceptible: and in this respect, as well as in the position of the imago in repose—with the head elevated, and the apex of the wings touching the surface upon which the insect rests—it makes an approach to *Gracillaria.*

The larvae are very cleanly, always depositing the frass outside of the mine; and the mines are always upon the upper side of the leaves, frequently at the edge, and resembling the mines of some *Gracillariæ.* It pupates in the mine.

1. *Tischeria malifoliella,* Clem. *Proc. Acad. Nat. Sci. Phila., 1860, p. 208.*

A plain bronzy-brown insect, having an *alar ex.* of a little more than ¼ inch. Dr. Clemens found it in apple leaves, and I have also bred it from leaves of different species of Haw *(Cratægus),* Sweet Scented Crab *(Pyrus coronaria),* Blackberry *(Rubus villosus),* and Raspberry *(R. occidentalis).* And it probably mines other species of *Rosaceæ.*

Dr. Clemens also very briefly characterizes the following species, in the *Proc. Acad. Nat. Sci. Phila., 1859, p. 326,* viz.:—

T. solidagonifoliella, mining leaves of Solidago, which I have never met with.

T. Zelleriella and *T. citrinipenella,* both of which feed within Oak leaves.

T. quercilella, Proc. Ent. Soc, Phila., v. 2, p. 13, which also mines Oak leaves.

I am not certain that I have seen either of these Oak-feeding species. I have, however, several Oak-feeding species differing slightly from these, and from each other. Dr. Clemens seems to have doubted whether the species described by him were really distinct; and mine, and those of Dr. Clemens resemble each other so closely, that only an attentive study of the mines and insects in all their stages, and with many specimens, can give anything like certainty as to the distinctness of species. I therefore postpone any further descriptions of species.

CEMIOSTOMA.

C. albella, ante, mines the leaves of the Cottonwood *(Populus monilifera)*, and may, therefore, be an American species—if it is not the European *C. susinella.*

I have also cocoons of a species which mines the leaves of Yellow Willow *(Salix alba)*, and Weeping Willow *(S. Babylonica)*—both imported species. The cocoons do not differ from those of *C. albella*, and possibly it may be that species. The mines are very filthy, and the larva hides in the frass, its filthy habits contrasting strongly with the singular purity and beauty of the resurrected imago.

ON THE LARVA OF HYPERETIS ALIENARIA, *Herr. Sch.*

BY W. SAUNDERS, LONDON, ONT.

The larva of this beautiful geometric moth is dark brown, and feeds on beech. The specimens, from which the subjoined description was made, were taken on the 10th of September, by beating the branches of some beech trees over an umbrella.

Length one inch, body cylindrical.

Head medium sized, bilobed, dark brown, with two bluish-white lines in front; mandibles paler.

Body above, dark brown, with a row of dull white dots on each side, one or two on each segment, most prominent from fifth to eighth segments inclusive, less distinct towards each extremity. On the posterior part of ninth segment were two rather prominent roundish black tubercles, with a few whitish streaks in front at their base. Terminal segment of a bluish tint, flattened and spreading.

The under surface was rather paler than the upper, with a central row of yellowish-white dots from fifth to tenth segments inclusive; from the second to the fourth, the colour was bluish-green, and on twelfth segment was a patch of yellow; feet bluish-green, with a streak of brown, prolegs brown on the outside, but bluish-green within.

Two of these larvæ entered the chrysalis state on the 19th of September, having formed a rude case in which to secrete themselves, by binding two leaves together with threads of silk. One of them produced the imago on the 18th, the other on the 21st of May following.

NOTES ON MEGACHILE BREVIS, *Say*.

BY E. B. REED, LONDON, ONT.

While inspecting, during the past summer, the fruit orchards of a friend residing in this neighbourhood, my attention was attracted by the peculiar appearance of the leaves of a young plum tree. At the first glance, I

FIG. 38.

thought it might be affected by *aphides*, but, on closer examination, I found unmistakable evidence of the work of some leaf-cutting bee, in the circular holes in many of the leaves, and on opening one of the coils of leaves, of which there were four or five, I discovered the curious chambers

of the bee, each containing a half-grown grub, comfortably ensconced, with its modicum of food. I took some coils home, but only succeeded in rearing two perfect insects, which Mr. C. V. Riley, of St. Louis, Mo., kindly identified for me, as being *Megachile brevis*, Say, and which are represented in fig. 38.

My chief object in this communication is to call attention to the peculiarity of the cells being constructed on the leaves of the tree, and not, as is usually the case, in some post or fence-rail, or in a chamber excavated in the ground. I am not aware that this has been noticed before. Each coil contained probably four or five chambers. The three I took had five, and I left others on the tree. The leaf, or outside wrapper, appeared to be fastened with some kind of cement, while the interior portion was contrived and planned in the manner usual to this little upholsterer, and which has been so admirably explained and related by various Entomological writers. The genus *Megachile* consists usually of solitary bees, and as far as I can gather, they construct but one nest. But in this case, it would appear that more than one insect had attacked the tree. I saw no bees in the immediate vicinity, nor could I detect traces of their work on other trees. The tree stood quite remote from any rose bush, or in fact from any tree having the usual form of serrated leaves, which leaf-cutting bees generally select. The coils appeared to be all finished, and apparently of about the same date of construction. In those I examined, there was not much difference in the age of the larvæ.

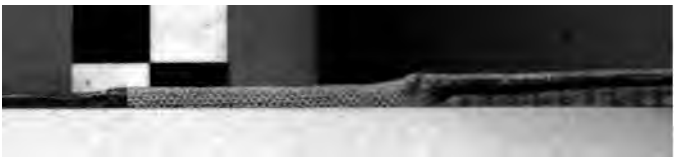
INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 192.)

Genus DICHELONYCHA *Harris.*—Labrum transverse, lanceolate, scarcely emarginate. Mandibles short, trigonal, incurved, toothless, acute: molary space transverse, furrowed. Maxillæ minute, linear, bidentate, with short teeth. Labium subquadrangular, not distinct from the mentum. Palpi maxillary four-jointed; first joint very minute; second longer than the third, obconical; third triangular; last joint as long as the three others together, very large, subsecuriform. Palpi labial three-jointed; joints short, subfiliform; last truncated. Antennæ nine-jointed; scape obconi-



cal, incrassated; pedicel subspherical; third and fourth joints subfiliform; fifth obconical; sixth subturbinate; the three last forming a short subovate knob. Body narrow, subcylindrical. Head subquadrangular; nose transverse, separated by an indistinct obtusangular line, anteriorly reflexed; rhinarium transverse marked with a transverse series of rather large punctures; eyes prominent; canthus entering: prothorax hexagonal, the sides being obtusangular: scutellum rounded at the vertex, dilated at the base: elytra linear, rounded at the apex, obsoletely ridged, wrinkled; epipleura vertical, narrow: legs rather slender; hind legs long; cubit tridentate; tarsi filiform; claws equal, all bifid at the apex: podex subtriangular.

[134.] This genus evidently belongs to the same family with *Macrodactylus*, from which it is distinguished by having its maxillæ armed only with two teeth, the last joint of its palpi of a different shape, and its labium approaching to a square form: whereas in the latter genus the maxillæ are more conspicuous and armed with three teeth, the last joint of the palpi is subovate, and the labium is oblong and channelled.

The species of this genus, as far as at present known, appear to be confined to the more northern parts of the new world; I have seen none south of the province of Massachusetts, from whence I have received specimens both from Dr. Harris and Mr. Drake. Type of the genus *Melolontha linearis* Herbst.

182. DICHELONYCHA BACKII *Kirby*.—Plate ii., fig. 6.—Length of body 4½ lines. Several specimens taken in Lat. 54°.

Body black, glossy, hairy, especially underneath, with white decumbent hairs; above thickly and coarsely punctured. Nose much reflexed, margin entire; stalk of the antennæ chestnut; elytra silky, green, more or less bronzed.

VARIETY B. Antennæ rufous. Tarsi pale chestnut. [Taken on north shore of Lake Superior by Agassiz's Expedition.]

183. DICHELONYCHA VIRESCENS *Kirby*.—Length of body 4¾ — 5 lines. Taken in Canada by Dr. Bigsby, in Nova Scotia by Dr. Mac Culloch, in Massachusetts by Dr. Harris, and in Pennsylvania by Dr. Horsfield. Dr. Bigsby found it common on the different species of *Salix*.

[135.] Body piceous, thickly covered underneath, except the disk of the breast and abdomen, with decumbent snowy hairs, minutely punctured, punctures most numerous on the upper side. Head nearly black, covered with glittering decumbent hairs; nose very obtuse and almost truncate, less reflexed than in *D. Backii*, reflexed part obscurely rufous; rhinarium, underside of the head, and mouth with its organs, rufous;

antennae reddish-yellow: prothorax nearly black with the sides a little paler, with a longitudinal discoidal rather obsolete channel and an impression on each side; sprinkled with short glittering decumbent hairs: scutellum rufous, thickly covered at the base with whitish decumbent hairs: elytra reddish-yellow tinted with green, sprinkled with short decumbent whitish hairs, the lateral punctures are almost arranged in dense rows: abdomen rufous; podex thickly covered with snowy hairs: legs reddish-yellow; tarsi darker; posterior tibiae black, reddish at the base; posterior tarsi piceous.

VARIETY B. Head and prothorax rufopiceous; legs rufous.

C. Head and prothorax rufous mottled with dusky; elytra with a green spot at the shoulders and tips; posterior legs entirely rufous; trunk rufous.

[This species is in all probability synonymous with *D. elongatula* Schon., the var. C belonging to *D. subvittata* Lec. Both of these species are common in Canada; we have generally taken them upon various kinds of Oaks.]

184. DICHELONYCHA TESTACEA *Kirby*.—Length of body 4⅓ lines. Taken by Dr. Bigsby in Canada.

Very similar to Variety C of the preceding species; but the body, with the exception of the eyes which are black, is entirely of one colour, rufo-testaceous, the head, prothorax, and tarsi being rather darker than the rest; the eyes are larger and more prominent; the head and prothorax, especially the latter, are more thickly and minutely punctured; and in this there is no dorsal channel: its margins, especially the lateral, are more hairy, the elytra exhibit no humeral or apical green spot; and they are very slightly tinted with that colour. [Two females found at Eagle Harbour, Lake Superior, by Dr. Le Conte. Included in the List of Canadian Coleoptera.]

[136.] 185. CETONIA FULGIDA *Fabr.*—Length of body 7½ lines. Taken in Canada, at Lake St. Clair, by Dr. Bigsby.

Body depressed, of a beautiful glossy green. Head black underneath, above grossly punctured; eyes reddish-brown; antennae brown-black; nose anteriorly subemarginate and a little reflexed; prothorax with a triple posterior sinus, grossly but not thickly punctured, sides luteous: scutellum an isosceles triangle, impunctured: elytra, in some lights, luteous, in others with a shade of green; at the base grossly but not thickly punctured, the remainder of the elytrum is acuducted like net work; disk longitudinally depressed: podex dusky, luteous at the apex,

with four triangular, white, basilar spots; abdomen underneath with a double series of triangular white spots on each side, the outer ones elongated: sides of the breast hairy; mesosternum suborbicular, hairy; legs luteous; tarsi and base of the cubits, brown-black. [This beautiful insect, now included in the genus *Euryomia* Burm., is taken occasionally, but not commonly, in Ontario.]

186. TRICHIUS BIGSBII *Kirby*.—Length of body 7 lines. Taken in Canada, near Lake St. Clair, by Dr. Bigsby.

[137.] This species exhibits the habit and general aspect of *T. fasciatus*, but it is larger and less hairy. Body obovate, black, covered more or less with tawny longish hairs. Head quadrangular; nose reflexed, emarginate; antennae and palpi luteous, black at the tip; prothorax trapezoidal, narrowest anteriorly, sides rounded or subobtusangular, posteriorly with an obsolete sinus near each angle; scutellum short, rounded at the apex: elytra without hairs, covered as it were with a bloom; luteous with a black margin and nine black spots—viz. one large one at the shoulders, seven in the disk arranged transversely 2, 3, 2, and one larger than the rest on the apical tumour; the humeral and apical spots are glossy: three tawny-yellow mealy spots, the intermediate one straight and longitudinal, and the lateral ones sinuated and oblique, mark the podex: the tibiae and tarsi of the four anterior legs are deep ferruginous; cubit bidentate, [Synonymous with GNORIMUS MACULOSUS Knoch. Taken, but rarely, in Canada.]

187. TRICHIUS ASSIMILIS *Kirby*.—Length of body 4¼—5 lines. Taken in Lat. 65°.; in Nova Scotia by Capt. Hall; and in Massachusetts by Dr. Harris.

[138.] Body obovate, black, covered more or less with long yellowish hairs. Head punctured; nose reflexed, emarginate; stalk of the antennae testaceous, scape and knob black; palpi dusky: prothorax punctured, less hairy in the disk, not channelled: elytra black, very short, depressed next the suture with an intermediate ridge; at the base is a large pale-yellow spot common to both elytra, from which run a pair of narrow, white, mealy bands, which nearly reach the external margin, and a white mealy stripe adjoining the suture also runs from the same spot to the apex of the elytrum: the podex is covered with long yellowish hairs, so thick on the sides as almost to conceal the oblong white mealy spot common to the subgenus; legs black.

N. B.—In the specimen taken in the Expedition, the white mealy stripe next the suture appears to have been rubbed off and and is replaced

by a continuation of the pale spot. [Previously described as *T. affinis* Gory. Taken in Canada.]

188. TRICHIUS ROTUNDICOLLIS *Kirby*.—Length of body 5½ lines. Taken in Nova Scotia by Capt. Hall.

Body obovate, black; covered, particularly underneath, with longish pale hairs. Head very thickly punctured; nose reflexed, emarginate; stalk of the antennae, excluding the scape, testaceous: prothorax suborbicular, with the segment of a circle taken out next the head; very thickly punctured, channelled, sprinkled with short yellowish hairs; at the side of each of the four angles is a mealy-white spot: the elytra next the lateral margin have two transverse mealy-white streaks or bands, which are continued towards the suture by a broader, naked, ferruginous, obscure band; just below the scutellum, on each elytrum, is another mealy stripe, and parallel with the suture is an obscure, naked, ferruginous one: podex hairy with the ordinary mealy pale spots very conspicuous; it is sculptured with transverse undulated lines: cubits robust with two stout teeth: a mealy spot marks the base of the posterior legs. [Synonymous with *T. piger* Fabr.: taken commonly in Ontario.]

189. TRICHIUS VIRIDANS *Kirby*.—Length of body 4¼ lines. A single specimen taken in Canada by Dr. Bigsby.

In the markings of its elytra this species agrees precisely with that last described, but the upper side of the body, especially the head and prothorax, is green; the latter is of a different shape and less thickly punctured; and the cubit and its teeth are less robust: the podex also is more hairy. These can scarcely, all of them, be mere sexual distinctions.

It seems intermediate between *T. rotundicollis* and *T. viridulus*. [A variety of *T. affinis* Gory.]

[140.] 190. TRICHIUS RUGOSUS *Kirby*.—Length of body 10½—13 lines. Taken in Nova Scotia by Dr. Mac Culloch and Capt. Hall.

Body rather glossy, dark pitch-colour, naked above with a few scattered hairs on the underside and on the legs. Head above plane, thickly covered with impressions and punctures that anastomose and run into each other, in some specimens leaving here and there some elevated, levigated, narrow spaces: nose anteriorly transverse, reflexed: prothorax with a longitudinal posteriorly abbreviated channel; sides obtusangular; surface covered, less thickly in the disk, with large, and often confluent, punctures: scutellum an isosceles triangle, channelled, with a few scattered large punctures on each side: elytra indistinctly furrowed, confluently and irregularly wrinkled, wrinkles marked with shallow indistinct punctures,

interstices elevated: cubit acutely tridentate: podex transversely irregularly acuducted. [This is a description of the *female* of *Osmoderma scabra* Dej., a species quite common in Ontario.]

191. TRICHIUS FOVEATUS *Kirby*.—Length of body 11½ lines. Taken in Nova Scotia by Capt. Hall.

Near the preceding species, but perfectly distinct. Body nearly naked, somewhat glossy, of a dark pitch-colour. Nose and front between the eyes with a very deep and large impression, the bed of which is acuducted in circles with a minute puncture in the centre of each; the rest of the head is confluently punctured; above the bed of the antennae the front rises into a rather lofty levigated prominence: the prothorax is shaped like that of *G. rugosus*, but is rather less obtusangular, the channel is deeper, with its sides more elevated, and there are one or two slight impressions between it and the margin; the punctures on the disk are rather more numerous: the elytra are paler than the rest of the body and a little bronzed, the wrinkles of the surface are more vermiform than in the species just named, without any punctures, and the appearance of furrows is less distinct: the podex is distinctly punctured and scarcely acuducted; and the cubit is sinuated rather than dentated, the three prominences being extremely obtuse. [A description of the *male* of *Osmoderma scabra* Dej.]

[141.] 192. PLATYCERUS PICEUS *Web.*—Length of body 6 lines. A single specimen taken in the journey from New York to Cumberland-house.

[142.] Body dark piceous, rather glossy, thickly punctured. Nose very retuse, or rather with a large sinus: mandibles shorter than the head, acute, armed on their inner side with a stout tooth with the segment of a circle taken out of it; antennae pale chestnut: prothorax with the lateral margin obtusangular, subcrenate, and reflexed; disk longitudinally impunctured, and obsoletely channelled: scutellum channelled, impunctured: elytra furrowed: cubit serrulate and denticulate, two sharp teeth longer than the rest at the apex; tarsi chestnut. This is the smallest species of the stag-beetle tribe. [Placed, with a mark of interrogation, as a synonym of *Platycerus depressus* Lec. This specific name is preoccupied by McLeay's *Ceruchus piceus*. *P. Depressus* is taken in Canada.]

193. PASSALUS INTERRUPTUS *Linn.*—Length of body 1¼—1⅜ inch. Many taken in the journey from New York to Cumberland-house.

Body black or piceous, underneath sometimes rufo-piceous, impunctured, glossy. Head with a crooked horn between the eyes pointing

towards the mouth, and a triangular elevation adjoining each eye on the inner side; labrum with a deep sinus; mandibles with three teeth at the extremity, and one in the middle of the upper side; knob of the antennae consisting of three hairy joints, the outer one thicker than the others and curved: prothorax channelled, impressed on each side near the base; under a powerful lens several scattered very minute punctures may be discovered on its surface; the ora, or undersides of the prothorax, are likewise punctured, and soft with tawny hairs: elytra furrowed; furrows punctured; cubit many-toothed; intermediate tibiae densely bearded, on the outside, with tawny hairs.

The bent or nodding horn on the head of the species here described has generally been taken for a sexual character; but I am inclined to regard this as a mistaken notion. Specimens thus circumstanced, as far as I have been able to ascertain, have hitherto been found only in North America; while those with a tuberculated head are found in various parts of South America, in the East and West Indies: and I have one in my cabinet from New Holland. Eleven specimens of the former were collected in the Expedition, varying in size, and not a single one of the latter. [Generally known by the Fabrician name of *P. cornutus*. Taken frequently in the southern and western parts of Ontario.]

MEETING OF THE LONDON BRANCH.

The regular monthly meeting of the London branch of the Entomological Society of Ontario, was held on Friday evening, the 15th inst., at the residence of Mr. Saunders—the President, Mr. C. Chapman, in the chair.

After the usual routine business was disposed of, the recent death of one of the active members of the Society was referred to: that of Mr. B Billings, of Ottawa. His loss was deeply regretted, and the following resolution of condolence and sympathy unanimously passed:—

Resolved.—That we have heard, with deep regret and sorrow, of the loss of one of our active members by death: the late B. Billings, Esq., of Ottawa, a man who, by his generous bearing towards his fellow-labourers, and his own active work in Entomological science, has won for him the highest esteem; and, while we sincerely feel the loss which our Society has

sustained in his removal, we tender our warmest sympathies to his bereaved family in their severe affliction.

Resolved.—That a copy of the above Resolution be forwarded to the widow of the deceased, and that it be also published in the CANADIAN ENTOMOLOGIST.

Mr. W. Saunders exhibited the following interesting insects :—

1st. Five specimens of unnamed Coleoptera belonging to the family *Cerambycidæ*, from the collection of R. V. Rogers, Esq., Kingston, all of which were new to the members present, among them a *Leptura*, a *Clytus*, and an *Elaphidion*.

2nd. A dipterous insect, from the collection of Mr. G. J. Bowles, Quebec, probably *Trypeta Canadensis*, Loew, which he has found injuring the fruit of both the red and white currant. Mr. Bowles says: "I got a number of the infested currants when the larvæ were about full grown, but owing to their being kept too dry, I did not succeed in raising many specimens. They enter the currants while the latter are green, and a little round black scar in the side, shows where they made their way in. The grub is white, and about .30 in. long when full grown. The currants ripen prematurely, and, generally, begin to decay, and drop to the ground. I think the larva goes into the ground to pupate. Only one made its cocoon, out of those I gathered, and it was made loose in the box. I have seen them only in one garden, where I met with them several years ago, and again last summer; but there they were very plentiful. I should say that one currant out of every five or six had a grub in it."

3rd. An ichneumon, parasitic on *Tortrix rosaceana*, which Mr. Saunders has found to infest it very commonly. One point worthy of notice in relation to it is its size. The single larva of the fly almost fills the body of the caterpillar, and yet the latter goes on actively feeding, and grows to maturity, without manifesting any symptoms of inconvenience. When about ready to enter the chrysalis state, the occupant eats its way out of the body of its victim, which shrinks up and dies, and the parasite spins a cocoon differing in character from that of the *Tortrix*, but containing a pupa nearly as large. The species has not yet been determined.

4th. Another ichneumon, a parasite also on a little green leaf-roller, undetermined, which has been found attacking the gooseberry in great numbers, and is very destructive. Unlike that previously mentioned, this fly is quite small, and several specimens are produced from each of the larvæ of the *Tortrix*. The cocoon of the parasite was also shown. It is small, oval, and of a dark brown colour.

5th. A handsome, undetermined *Tortrix*, with brown fore-wings, powdered with metallic scales, and which Mr. Saunders reports to be quite common in a locality near London.

6th. A small beetle, a *Sitona*, closely allied to, if not identical, with *panacea;* found in large numbers in a bottle of powdered carraway seeds. Specimens of the dead larvæ were found along with the perfect insect, but they were too much dried up and discoloured to admit of description. In the pupal condition, the insect occupies a small oval chamber in the powder, from which the beetle escapes at maturity.

ACKNOWLEDGMENTS.

COLLECTION OF COLEOPTERA.—We beg to acknowledge, with many thanks, the receipt of a box of Coleoptera from the Rev. N. D. St. Cyr, Seminaire de Nicolet, P. Q. ; we trust that our esteemed correspondent will accept our apologies for having so long delayed to notice them. Our time is so much engrossed with the various and multiplied duties that have of late devolved upon us, that we find it impossible to be punctual with our correspondence, or indeed to maintain it at all as we should like. We trust, however, that our present labours will be diminished before long, and that then we may hope once more to obtain the good graces of our friends, which, we fear, we must by this time have lost in many cases by our apparent neglect. M. St. Cyr, in his gift to the Society's Cabinet, has included 247 specimens of Coleoptera, belonging to 71 different species—many of them rare and interesting. They reached us in very good order indeed, with only the almost inevitable loss of a few antennæ. As our correspondent writes in French, we may perhaps be pardoned for departing from our rule, and quoting his very kind and flattering expressions regarding our Society and this publication :—"Je m'empresse de saisir cette occasion pour nous feliciter du succes tres remarquable que vous avez obtenu : la Societe est florissante, et le CANADIAN ENTOMOLOGIST, toujours attendu avec impatience, nous arrive toujours rempli d'articles extremement interessants sur cette belle science. Je ne crains pas de le dire votre Journal peut rivaliser avec honneur, avec les publications du meme genre faites aux Etats-Unis. La forme, le fond, tout y'est irreprochable."

VESPA CRABRO.—We are very much obliged indeed to our correspondent, Mr. James Angus, of West Farms, N. Y., for some specimens (5 males, 5 females, and 6 neuters), of this most formidable-looking hornet. They form a valued addition to our cabinet.

EXCHANGES, &c.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

COLLECTING TOUR IN LABRADOR.—The undersigned intends to leave next spring, *in the first vessel from Quebec*, on a collecting tour in LABRADOR. Insects of all orders will be collected; and as many species will be, no doubt, unique, undetermined or new to science, those who are anxious to obtain specimens of LEPIDOPTERA and COLEOPTERA will please communicate with me as early as possible. Terms in accordance with number and specialties.—WM. COUPER, Montreal.

CORK AND PINS.—We have a good supply of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1, 2, 5 and 6, price 50 cents (gold) per packet of 500.

CANADIAN ENTOMOLOGIST, Vols. 1 and 2.—We have a few copies left of these volumes—No. 1 of vol. 1 being deficient, however, and out of print. Price $1.25 (gold) each.

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AGENTS FOR THE ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.; G. J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y. Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

The Canadian Entomologist.

VOL. III. LONDON, ONT., DECEMBER, 1871. No. 12

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 209.

LAVERNA.

This genus may be distinguished by the tufts of raised scales on the anterior wings. The antennae are more than half as long as the wings, simple, inserted just above the eyes. Head and face smooth, with appressed scales. Face rather broad. Tongue very short. No maxillary palpi; labial palpi curving around the sides of the head upwards, the tips approaching each other on the vertex, the third joint shorter than the second, which is laterally compressed and slightly clavate.

For a fuller diagnosis, see Dr. Clemens' *Proc. Acad. Nat. Sci. Phila., 1860, p. 170.*

L. cephalonthiella. N. sp.

Tongue and face white; palpi grayish-white beneath, gray above; antennae gray, annulate with dark brown, tipped with white, and with four or five very distinct white annulations near the tip. Thorax and wings dark bluish-gray, flecked with numerous white scales and specks. The wings are irregularly spotted with velvety black; have an ochreous patch at the base of the inner margin, not very distinct, and a larger one upon the disc, and an irregular indistinctly outlined fasciae nearly crossing the wing, just before the third costal streak, and dusted with golden in the middle, and with white upon the costa. The ochreous patches are not distinct in outline, and seem to be composed of confluent streaks. Two rather large tufts of elevated scales within the inner margin, the first velvety black, the second ochreous, margined with velvety black, and larger than the first. The first tuft is before, and the second behind the middle. Three velvety black, slightly oblique costal streaks, the first small, placed before the middle; the second larger, behind the middle; and the third and largest just before the ciliae. In some lights,

the tufts glow with crimson and purple hues, and the ochreous patches assume the form of indefinite wide bands. There is an oblique costal streak of rather dense white dusting before the apex, and an opposite dorsal one. Three dark brown hinder marginal lines, one at the base of the ciliae, the second before the apex, and the third at the apex, of the ciliae. Dorsal ciliae dark slate-colour, *with eight or ten distinct white specks near the base.* Posterior wings and ciliae slate-colour. Abdomen slate-colour, with crimson and purplish reflections. But the colours of the entire insect vary somewhat with the direction of the light. *Alar ex.* about ⅓ inch. Common. Kentucky.

The larva mines the leaves of the Button Bush *(Cephalanthus occidentalis).* I found them early in October, and a few days afterwards, they became pupae, and within a week thereafter, produced the imago. It pupates on the ground, and the imago most probably hybernates.

The mine and larva resemble those of the genus *Antispila*, but the larva is reddish.

This is the only *Laverna* that I have found, and is a very handsome insect.

ASPIDISCA, *Clemens.*

Head smooth, with appressed scales. Tongue naked, short. Labial palpi short, much separated. Antennae about one half as long as the wings. Size, very small.

(This brief, generic diagnosis is condensed from Dr. Clemens' account published in the *Proc. Acad. Nat. Sci. Phila., 1860, v. 11., corrected at p. 209.* Dr. Clemens errs, however, in the statement that there are no maxillary palpi. They are not visible without dissection, but upon dissection, minute *one-jointed* palpi are perceptible).

The larvae are cylindrical, depressed; head smaller than the first segment. No true legs nor prolegs, but in their places, and also on some of the other segments, are what appear to be discs, which act as suckers. It is doubtful, however, if they do so act, as they appear on the dorsal as well as ventral surfaces. They are miners through their whole larval existence, and when ready to pupate, they cut out a minute case, and, sewing together the edges, let themselves down by a thread, and, notwithstanding their apparent want of means of locomotion, they manage to transport themselves and their cases frequently through long grass, or over seemingly impracticable routes, for many rods, before spinning the silken "byssus," by which the case is attached to a tree, or fence, or blade of grass, for the pupal repose.

1. *A. splendoriferella*, Clem. *Loc. cit.*

Lyonetia Saccatella, Packard, Guide, *p. 355, and plate 8, figs. 18, a and b.*

Dr. Clemens found this "perfect little gem," as Dr. Packard truly calls it, mining the leaves of Haw trees *(Cratægus)* in August, and cutting out its cases, preparatory to pupating, *in the latter part of August and in September.* He also found a similar larva mining the leaves of the Wild Cherry tree *(Prunus serotina)* at the same time, but was uncertain as to the species. I have bred it from the mines, and find it to be this species. I have also bred it from the leaves of the Sweet Scented Crab *(Pyrus coronaria), and from those of the Apple.* At Linden Grove Cemetery, at this place, it occurs by the million. In that Cemetery (so called because there are only two or three Linden saplings in it, I suppose), there are a great many Wild Cherry trees, and in August, scarcely a leaf can be seen without a mine, and, usually, from two to five or six in each; and in September, after they begin to descend, to pass under one of the trees is like sticking one's head into a cobweb. A little later, the trees and fences are plastered over with their little cases.

Dr. Packard's account of his *Lyonetia saccatella* is brief, as it must of necessity be, in such a work as the "Guide," but I think there can be no doubt that it is identical with this species, which was first described by Dr. Clemens in the "*Proceedings*," *loc. cit.* I am led to this conclusion by the following facts :—

The species of *Lyonetia* are not case bearers, but leave their mines to pupate on a *nidus* on the ground. The antennae in *Lyonetia* are about as long as the wings, while Dr. Packard's figure represents them, as they are in this species, about one half as long as the wings. The description of the species by Dr. Packard is so accurate for this species (considering its brevity), that it is not probable that two species belonging to different genera, should resemble each other so closely; and he found, at the same time, upon the same food-plant, and with the extraordinary "mimicry" carried so far, that one of the species, belonging to a genus in which there are no other case bearers, assumes the case bearing habit in imitation of the other. Such a case of mimicry would delight Messrs. Wallace & Bates beyond measure.

Dr. Packard evidently supposed that his species was a case bearer throughout its larval existence. But the fact which he states, that the case is made of the cuticle of leaves, shews that it has once been a miner. He found it on the leaves of the Apple, in the latter part of August and in

September—just the period when *A. splendoriferella* is cutting out its cases, crawling over the leaves, and fixing its byssus to the limbs and trunks, as Dr. Packard's species did.

On the other hand, some of the minuter markings, towards the apex of the wing, are not mentioned by Dr. Packard, nor shown in the figure. The form of the case in the figure is by no means accurate, though that of the larva is. And the *alar ex.* is stated to be .20 inch, whilst I have never found it to exceed two lines.

2. *A. luciflucella*, Clem. *Op. cit., p. 209.*

I have found the larvae mining the leaves of Hickory trees, but have not yet succeeded in raising them from the mines. According to Dr. Clemens' description, it is a little larger than *A. splendoriferella*, and resembles more closely the next described species. Kentucky and Pennsylvania. Not common.

3. *A. Ella. N. sp.*

Head silvery white, tinged with yellowish. Antennae pale fuscous above, silvery beneath ; thorax and about the basal one-third of the wings, silvery gray, remainder of the wings golden brown or dark brown, according to the light, sometimes appearing reddish golden. A rather large costal white streak in the dark part of the wing, just before the middle, with an indistinct reddish or yellowish spot before it, within the costal margin, and a triangular white dorsal streak nearly opposite, but a little before, and a costal faint yellowish indistinct spot behind it. A triangular, velvety, black, apical spot with its base towards the ciliae, a small silvery spot at its apex, and a narrow silvery line on each of its sides; ciliae silvery. Under surface and legs silvery white. *Alar ex.* about ¼ inch. (Smaller than *A. splendoriferella*). Larva and food plant unknown. A single specimen found in its case attached to the bark of an Oak tree.

Named in honor of a lady friend, who, like our "micro," is both "*petite*" and pretty.

Dr. Clemens mentions the larvae of two other species, one of which mines the leaves of the Ironwood *(Ostrya Virginica)*, and the other mines different species of Willows *(Salix)*. I have met with both mines, but, like Dr. Clemens, I have never seen the imagines, unless *A. Ella* should prove to be one of them.

These are the only known species of the genus.

NOTES ON LEPIDOPTEROUS LARVÆ.

BY W. SAUNDERS, LONDON, ONT.

In November, 1867, I received from my esteemed friend, the late B. Billings, of Ottawa, several specimens of the larva of that very rare arctian, *A. parthenos*, which he had reared from eggs laid by a captured female in a box. They were apparently about two-thirds grown, and ready to hybernate for the winter; a common practice with many species belonging to this interesting family of moths.

The length of this larva was 1¼ inches, body cylindrical.

Head medium sized, bilobed, black and shining, with a few brownish hairs.

Body above, black, with transverse rows of shining tubercles, which were rather large, and of a dull brownish-white colour, excepting a few on the anterior segments, which were black; and from each of them was emitted a tuft of brown hairs. The hairs on the anterior segments and around the base of the body, were rather short; the others long and silky, and of a slightly paler brown colour, recurved backwards. Stigmata elongated, and of a yellowish orange colour.

The under surface was black, with a slight brownish tinge, 5th, 6th, 11th and 12th segments, each with a transverse row of black tubercles in continuation of those above, each tubercle emitting several short dark brown hairs. Feet black, ringed with dull whitish-brown, prolegs black without, tipped with greenish-brown; within, greenish-brown.

I buried these larvæ a short distance underground, stowed away carefully in a box with some loose pieces of chip, with the hope that they would survive the winter. In this, however, I was disappointed, for on disinterring the box very early in Spring, I found them all dead.

STEGANIA PUSTULARIA *Guenée*.—The larva of this little delicate-looking geometric moth, feeds on the Maple. It is common in our neighbourhood, and may be readily got, in season, by striking the branches of the trees a sharp blow, when it drops at once part way to the ground, remaining suspended by a silken thread, by means of which, when danger passes, it can regain its position on the tree. It is found full grown about the middle of June, enters the chrysalis state within a few days afterwards, and produces the moth early in July.

When full grown, the larva measures about five-eights of an inch in length, body cylindrical.

Head medium sized, rather flat in front, slightly bilobed, and of a pale green colour, with a few very fine hairs, invisible without a magnifying lens, scattered over its surface; mandibles tipped with black.

Body above bluish-green, with thickly set longitudinal stripes of whitish and yellowish. A double whitish dorsal line, with bordering lines of yellowish-white, neither of which are unbroken, but are formed of a succession of short lines and dots. Below these, on each side, are two or three imperfect white lines, made up of short streaks, and much fainter than those bordering the dorsal line; spaces between the segments yellowish. The skin all over the body is much wrinkled and folded.

The under surface is green, with a tinge of yellowish between the segments; feet yellowish-green, prolegs green, faintly tipped with brown.

The moth is of a pure white colour, with three or four reddish-brown spots on the costal margin of each of the fore-wings, and with a faint curved line of the same, crossing them a little beyond the middle; it expands 1 inch, This species was kindly determined for me by Dr. A. S. Packard, of Salem, Mass.

METROCAMPA PERLATA *Guenee.*—This pretty white geometer, which is larger than the last species referred to, I have bred from a larva which was found feeding on willow, and which entered the chrysalis state before I had an opportunity of describing it.

FIG. 39.

ACRONYCTA OBLINITA *Sm. & Abbot.*—This insect, which is admirably represented in all its stages in fig. 39, is well described by Mr. C. V. Riley, in his "Third Annual Report on the Noxious Insects of Illinois." In addition to the food plants there given, I have found the larva quite common on the cultivated Strawberry, and also on the Wild Raspberry. My specimens were taken early in September, and produced the imago about the middle of the following June. The larva is very handsome, while the moth is of a very plain grey colour.

EUPHANESSA (NUDARIA) MENDICA *Walk.*—A female of this species deposited eggs on the sides of a box, in which it was confined, on the 2nd and 3rd of July. They were of a bright red colour, and the young larvæ were hatched from them on the 8th of the same month. They were extremely active, about one-tenth of an inch long, with cylindrical bodies, and true geometers in their larval characteristics and mode of progression. The following description was taken at this stage in their history :-

Head large, bilobed, dark brown. Body above dull brownish-green, with a slight pinkish tinge, and with many short black and brown hairs. Under surface similar to the upper; feet and prolegs—of which latter there were two pairs only—greenish and semi-transparent.

I used my utmost endeavours to procure food for these larvæ, and introduced into the box in which they were confined, leaves belonging to many different families of plants, but failed to find anything they would eat. In the course of two or three days, they all died of starvation.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 217.)

FAMILY ELATERIDÆ.

[145.] 194. CAMPYLUS DENTICORNIS, *Kirby.*—Length of body 6 lines. Taken in Canada by Dr. Bigsby.

This is the American representative of *C. mesomelas*, from which it is sufficiently distinguished by its toothed antennae and longer prothorax. Body linear, black, hairy with pale decumbent hairs. Head punctured; antennae longer than the prothorax, filiform, with all the joints, except the scape, pedicel, and terminal one, terminating at their internal extremity in a prominent tooth, less conspicuous in the two lower ones; upper-lip, and nose which is reflexed and overhangs the mouth, yellow: prothorax channelled, punctured, quadrangular, with the anterior angles rounded, and the posterior diverging and terminating in a sharp tooth or prominence; sides rather wavy; limb yellow: scutellum subcordate: elytra minutely and thickly punctured, slightly furrowed, furrows thickly punctured; marked with a narrow yellow stripe which does not reach the apex; there is also a short yellow streak on the shoulders: base of the tibiae, claw-joint of the

tarsi, and claws, yellow. ["Lake Superior, Maine and Pennsylvania" (Le Conte). We have specimens taken in the neighbourhood of Ottawa, Ont.]

[146.] 195. PEDETES BRIGHTWELLI, *Kirby*.—Length of body 6 lines. Taken in Nova Scotia by Capt. Hall.

Body elongate, more slender than that of the type, testaceous; hairy, with decumbent pale hairs; thickly punctured. Head dusky-red; antennae longer than the prothorax, slenderer than usual in the tribe, scarcely serrated, with the four last joints rather slenderer than the rest; eyes large and hemispherical; nose a good deal reflexed: prothorax convex, channelled, dusky-red, darker in the disk: elytra pale testaceous: furrowed, furrows deeply punctured; interstices minutely punctured with scattered punctures: legs paler than the rest of the body, and nearly yellow. [Included now in the genus *Athous* Esch. Le Conte, in his "Revision of the Elateridæ of the United States," (Amer. Phil. Trans. vol. x., p. 425), states that this species occurs in the "Middle and Southern States, not rare. The specimen described by Kirby seems to have been a pale coloured variety of this species, which varies much in colour. In the male the thorax is constricted before the posterior angles, which are slightly divergent; in the female, the sides are straight and the angles do not diverge; the dorsal channel is never deep, and is frequently wanting."

SUBGENUS ASAPHES *Kirby*.

Body wider. Nose not overhanging the mouth. Rhinarium attenuated in the middle. Prothorax short, posterior angles carinated.

I am doubtful whether this should not be considered as forming a distinct genus. The general form is very different. But as the tarsi have suckers on the second and third joints, till more species are discovered, I have given it as only a subgenus of *Pedetes*.

[Dr. Le Conte (Am. Phil. Trans. x. 449) states that "although but one species of this genus is described by Kirby and another by Germar, I find that several of our Elaters possess characters which require them to be associated with his type. They seem to form a natural group approaching most nearly to Corymbites, and indeed differing from that genus only in the structure of the tarsi. The second and third joints of the tarsi are dilated beneath into a short spongy lobe: the first joint is as long as the second and third together, and usually spongy at the tip: the fourth joint is small and narrow, received upon the third, and is sometimes also spongy beneath: the fifth joint is elongate with simple claws."]

196. PEDETES (ASAPHES) RUFICORNIS *Kirby*.—Length of body 7 ¼ lines. Taken in Nova Scotia by Capt. Hall.

Body black, rather glossy, minutely punctured, downy with pale down. Antennæ, mouth, and palpi rufous or dusky-rufous; labrum and mandibles piceous; nose rounded, not reflexed, not overshadowing the mouth; antennæ serrated on the inner side in the middle, last joint acuminated: prothorax short, widest behind, very obsoletely channelled, sides submargined; posterior angles dentiform, strongly carinated: elytra piceous, or rufo-piceous, very slightly furrowed with oblong punctures in the furrows, interstices minutely punctured: margin of the abdomen and of the penultimate segment, rufous. [Previously described as *Elater memnonius* Herbst. Quite common in Canada; taken also in Maine, Ohio, Pennsylvania, Alabama (Le Conte).]

[148]. 197. PERIMECUS FULVIPES *Herbst.*—Length of body 7 lines. Taken in Canada by Dr. Bigsby.

Body black, punctured, glossy: gloss and colour obscured by numerous decumbent pale hairs. Antennæ pale chestnut, with the third joint double the length of the second: posterior angles of the prothorax carinated: elytra with nine rows of large and deep punctures, interstices minutely punctured: legs pale chestnut.

The only difference that I can discover between the American and European specimens, is in the length of the third joint of the antennæ, which in the latter is scarcely longer than the second; and this may probably be a sexual distinction. [Belongs to the genus *Melanotus* Esch., and is synonymous with *M. (Cratonychus) castanipes* Payk.]

198. PERIMECUS COMMUNIS *Gyll.*—Length of body 6⅓ lines. Several specimens taken at Cumberland-house, Lat. 54°.

Very similar to the preceding species, but much smaller. Body chestnut-coloured, darker or lighter in different specimens, punctured, glossy, hairy: third joint of the antennæ twice the length of the second: prothorax thickly punctured, obsoletely channelled, chiefly behind: elytra, antennæ, and legs rather paler than the rest of the body, the former sculptured as in the last species. [Taken in Canada. "Abundant as far as Nebraska" (Le Conte). Belongs to the genus *Melanotus.*]

[149.] 199. PERIMECUS SIMILIS *Kirby.*—Length of body 6¼ lines. Taken in Lat. 54°.

I should have given this as merely a variety of the last; but besides its blacker body, the punctures of the prothorax are not nearly so numerous, and there is no appearance of its being channelled: the breast is chestnut. [Belongs to the genus *Melanotus.*]

200. CTENICERUS KENDALLI *Kirby.*—Plate ii., fig. 7. Length of body 7 lines. A single specimen taken in Lat. 65°.

Body black, thickly punctured; gloss obscured by inconspicuous hairs. Head with two impressions between the eyes; nose subemarginate; antennæ shorter than the prothorax, serrated: prothorax longer than wide, channelled, posterior angles diverging, very acute, carinated: scutellum suboval, covered with white hairs: elytra rather wider than the prothorax, testaceous with a black discoidal blotch at the tip; slightly furrowed with punctures in the furrows: interstices punctured: legs piceous.

This species, which is a female, is related to *Ct. cupreus*, but is much wider in proportion to its length. [Belongs to the genus *Corymbites* Latr. "One specimen found on the north shore of Lake Superior. Mr. Randall found it in Maine" (Le Conte).]

[150.] 201. ELATER (APHOTISTUS) ÆRIPENNIS *Kirby*.—Length of body 6 lines. Several taken in Lat. 54°. Cumberland-house.

Body very black, without hairs, underneath very minutely punctured. Head thickly and confluently punctured; nose with two slight impressions: antennæ shorter than the prothorax, third joint longer than the fourth: prothorax very thickly punctured, obsoletely channelled, longer than wide, rather narrowest before, sides curving, posterior angles acute, diverging, carinated: scutellum heart-shaped: elytra bronzed, or green-bronzed; furrowed, furrows punctured; interstices convex, minutely punctured; tips acute: a discoidal rufous spot or band, and sometimes two, marks the underside of the abdomen: legs piceous.

This species is the American representative of *E. impressus*, from which it differs principally in being smaller, narrower in proportion, with the head and prothorax not at all bronzed, and the latter more thickly punctured and without any gloss. [Not uncommon in Canada; "very abundant at Lake Superior; found by Randall in Maine" (Le Conte). Belongs to the genus *Corymbites* Latr.]

FAMILY BUPRESTIDÆ.

[151.] 202. BUPRESTIS (ANOPLIS) RUSTICORUM *Kirby*.—Length of body 9¼ lines. A single specimen taken in Lat. 54°.

Body black-bronzed, punctured, glossy. Head with a levigated elevation in the centre between the eyes, channelled behind; marked with two yellow spots underneath on the cheeks, a triangular one adjoining the eyes on their inner side, and two dots of the same colour between them; prothorax grossly punctured with levigated spaces, the discoidal one longitudinal; above the scutellum is an impression; sides converging at the base of the prothorax; anterior angles with a yellow stripe: elytra slightly

furrowed with numerous very minute punctures in the furrows; rounded at the apex: interstices with scattered punctures; those of the second, third, fourth, fifth, eighth and ninth furrows elevated so as to form an obtuse ridge: the four last ventral segments of the abdomen have on each side a reddish-yellow spot, those on the last segment being the largest and most irregular; anus with two distinct lateral teeth.

This species is so similar to *B. rustica*, that at first I regarded it as merely a variety, that insect however is smaller; the head has a distinct longitudinal channel: the prothorax is less thickly punctured, and the sides, at the base, converge less but more suddenly: the elytra are truncated, or rather premorse, at the apex with a few minute denticles: the mandibles have a yellow spot, and there are none on the ventral segments of the abdomen, except the anal one: the anal teeth also are obsolete. [Belongs to the genus *Ancylochira* Esch. "Oregon and Washington Territories, abundant"(Le Conte).]

[152.] 203. BUPRESTIS (ANOPLIS) PAGANORUM *Kirby*.—Length of body 7¾ lines. A single specimen taken at Cumberland-house, Lat. 54°.

Very like the species last described. Body of the same colour, head, anterior angles of the prothorax, and underside of the abdomen similarly spotted, except that in the former there are no frontal dots. The prothorax however is differently shaped, being somewhat constricted anteriorly, with the sides towards the base rounded, it is also channelled; the sculpture of the elytra is similar, but they are more attenuated and truncated at the end, like *B. A. rustica*, and armed with three minute denticles. [Probably belongs also to *Ancylochira;* unknown to Dr. Le Conte.]

204. BUPRESTIS (ANOPLIS) NUTALLI *Kirby*.—Length of body 7½—8 lines. Several specimens taken in Lat. 65°. and on the Rocky Mountains.

This species appears to be related to *B. octoguttata*. Body black-bronzed, glossy, punctured; underneath with a few pale decumbent hairs. Head confluently punctured with several irregular connected levigated spaces; labial palpi, spot on the mandibles, labrum, lower margin of the eyes, and frontal spots, yellow: prothorax bisinuate both at the apex and base, grossly punctured with several levigated spaces; lateral margin, except the base, and part of the anterior, yellow; elytra slightly furrowed, furrows punctured: interstices alternately convex and plane; the sutural one is convex and forked at the base; the flat ones are most punctured, but the convex ones more grossly: in the disk of the elytra are three

equidistant irregular yellow spots arranged longitudinally, and nearer the base, on the second ridge, a line of confluent yellow dots; the apex of the elytra is truncated: [153] on each of the ventral segments of the abdomen the sides are marked with a triangular orange-coloured spot, those on the anal segment being larger and irregular: the coxæ also and underside of the thighs are partly of the same colour.

VARIETY B. Without the yellow line of confluent dots at the base of the elytra, and with the spots arranged longitudinally indistinct.

C. With all the ventral orange spots large and irregular.

D. Front with a large central spot. Base of the belly bluish.

E. Elytra with only yellow spots. Front as in D.

F. With only one distinct yellow spot.

The most certain distinction of this varying species is the alternately convex and plane interstice of the furrows of the elytra. [Belongs to *Ancylochira*. "Lake Superior, one female" (Le Conte).]

205. BUPRESTIS (ANOPLIS) LINEATA *Fabr.*—Length of body 9 lines. Taken in Nova Scotia by Capt. Hall.

Body above black-bronzed, underneath bronzed, punctured. Head below and mouth orange: mandibles black with a basilar orange spot; front obscurely banded and dotted with the same colour; vertex channelled: prothorax dilated posteriorly; anterior angles deep orange: elytra slightly furrowed: furrows scarcely punctured; interstices flat, grossly punctured; truncated at the apex and armed with three minute teeth, one nearly obsolete; on each elytrum are two obscure deep orange stripes, the outer one diverging towards the base so as to pass below the shoulders, the inner one subinterrupted, widest towards the base, and not reaching the apex: fore-breast anteriorly orange. [Taken in Canada, but not common. "Middle and Southern States, not rare. Varies very much in the fulvous markings of the elytra, which are normally two broad vittæ upon each; the extreme variation is where the outer vitta is broken into three spots, and the inner one into two; the two anterior spots are then connected by a transverse line forming a hamate spot. The tip of the abdomen in the male is truncate, with a little tooth on each side; in the female, it is broadly rounded, but the same teeth are seen. The under surface is dull bronze, with the head and anterior margin of the posternum fulvous" (Le Conte, Am. Phil. Trans. xi., p. 206). Belongs to *Ancylochira*.]

206. BUPRESTIS (ANOPLIS) FASCIATA *Fabr.*—Length of body 7—8

lines. Taken in Canada by Dr. Bigsby; B and C in Nova Scotia by Capt. Hall.

[154.] Body of a lovely brilliant green, punctured underneath with a few pale hairs. Head confluently punctured: antennæ bronzed; vertex channelled: prothorax transverse marked before the middle with two transverse impressions, and another just above the scutellum; grossly punctured: elytra furrowed; furrows thickly punctured; interstices convex with fewer punctures; apex truncated with the angles terminating in a short point; beyond the middle of the elytrum is a rather broad, especially next the suture, wavy orange band surrounded by a dusky blotch; beyond this and near the apex is another oblique abbreviated little band of the same colour.

VARIETY B. Smaller with the bands paler and narrower.

C. With only a single band narrowest next the suture: prothorax without the anterior impressions. [Quite common in many parts of Canada, in al lits variations. We found it abundant at Credit, Ont., but quite rare at Cobourg and Port Hope. Le Conte *(loc. cit.)* states that it is "not rare, especially in the Northern portions of the Atlantic States; varies in colour from green to blue, and also in the size of the markings of the elytra. The tip of the abdomen of the ♀ is truncate; in the ♂ it is truncate and bisinuate: the anterior tibiæ are simple." Belongs to *Ancylochira*.]

BOOKS RECEIVED.

First Annual Report on the Noxious Insects of the State of Illinois. By W. Le Baron, M. D., State Entomologist. Springfield, Ill., 1871. We have been favoured by Mr. Le Baron—the successor of the much lamented Mr. Walsh—with a copy of his *first* Report as State Entomologist we trust that it is the precursor of a long series during years to come. After some introductory remarks, the author takes up for consideration Insects injurious to the Apple, Pear and Plum trees, the Grape-vine, the Currant, the Potato, the Rose, and the Pine. Among the first mentioned, he describes a new species, "The Lesser Apple Leaf-folder" *(Tortrix malivorana)*, which appears to have been excessively destructive in the neighbourhood of Lacon, Ill.; and gives a full account of the beneficial labours of a Chalcis fly, parasitic upon the Apple Bark-louse. Another

new enemy to the horticulturist is figured and described—"the Callimorpha Pear Caterpillar" (*C. Lecontei* Boisd., var. *fulvicosta* Clemens.) The larva of *Acronycta superans* Guen., he records as affecting the leaves of Plum trees, and gives a full description of its larval and imago states.* Valuable descriptions are also given of the "Four-striped Plant-bug" (*Capsus quadrivittatus* Say), affecting the Currant, and of the "White Pine Leaf-louse" (*Mytilaspis pinifoliae* Fitch).

Notes on Chalcididæ. Parts iii. and iv. By Francis Walker, F.L.S. London, Janson, 1871. These pamphlets, for which we have to thank the author, contain numerous descriptions, illustrated by occasional woodcuts, of species of *Chalcididæ* from all parts of the world.

Le Naturaliste Canadien. Edited by M. L'Abbe Provancher (Quebec), has now reached, like ourselves, the close of its *third* volume. We may congratulate each other upon having survived the most perilous period in the life of a scientific journal, and feel a well assured hope that we may both continue, in our respective ends of the country, to do what we can to promote the study and knowledge of the natural history of the Dominion. Though designed especially for our French-speaking compatriots, we trust that *Le Naturaliste* will acquire an extensive circulation also among the Anglo-Saxon portion of the community. Our readers will find in its pages much to interest them of an Entomological character, as well as other departments of Zoology and Botany.

Les Petites Nouvelles Entomologiques (A. M. E. Deyrolles fils, 19 Rue de la Monnaie, Paris, France), though sadly interrupted during the siege and subsequent troubles in Paris, was at once resumed upon the cessation of hostilities, and is now conducted with quite as much spirit as formerly. We gladly translate from its pages much that is of more than local interest, from time to time. (We can supply a few copies at $1.25 per annum to our subscribers).

ERRATA.—On page 163, at the sixteenth line from the top, for "intercepted" read "interrupted;" on page 182, at the third line from the bottom, for "Cuniostoma" read "Cemiostoma;" on page 183, at the third line from the bottom, and on page 184, at the fourteenth line from the top, for "pupæ" read "proper."

* Our specimens of this moth, to which Mr. Le Baron refers, were determined for us by Mr. Walker of the British Museum; we think that the determination may be relied on, although Guenee's description is so meagre.

MISCELLANEOUS NOTES

PARASITE ON PIERIS RAPÆ.—The news of the appearance of an effective parasite on *P. rapæ* will, we doubt not, be hailed with delight by our Lower Canadian friends and the gardeners of the North-Eastern States. Mr. P. S. Sprague, of Boston, Mass., has kindly sent us several specimens, of both sexes, of this new arrival, respecting which he writes as follows:—"The *P. rapæ* chrysalis parasite, mentioned in my communication (CAN. ENT., vol. iii., page 158) proves, on examination by Dr. Packard, to be the introduced *Pteromalus puparum*. My son gathered about fifty of the chrysalids, every one of which was infested, as many many as forty specimens coming from a single one. The female walks over the chrysalis feeling with her antennæ for a suitable place to insert her ovipositor, and when found, drills a hole, which takes upon an average one minute in time." [Figure 40 represents the larva and chrysalis of this imported pest.]

FIG. 40.

The following excellent communication by Mr. Sprague's son, who bids fair to become an eminent Entomologist, we copy from the *Rural New Yorker*:

"A NEW ENEMY TO THE CABBAGE WORM.—Although I am a little boy, I think I can write something for the entomological column that will please the old folks. Almost everybody who raises cabbages has had a great many destroyed this year by a little green caterpillar, and I suppose they have seen a new, white butterfly, called the *Pieris rapæ*, flying around them.

This butterfly lays a little white egg on the leaves, which, in a few days, hatches out a little green caterpillar, which eats until it grows about an inch in length; then it goes and hunts up some sheltered place where it can go into a chrysalis. I was looking for some chrysalids for my father, when I saw a little fly walking all over them; by-and-by it made a little hole in the chrysalis to lay its eggs in. This fly is almost one-eighth of an inch long; it is of a golden colour. Some of the flies have yellow legs, and others have dark ones. They have four wings; the body is pointed at the end; there are about fifty of these flies in a chrysalis; the chrysalis looks as if it were all right, but if you break it open you will find it full of little grubs. This little fly kills so many of the chrysalids that in a few years the butterflies will not be so common, and cabbages will not be destroyed.—H. W. S., Boston, Mass."

EXCHANGES, &c.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

ADVERTISEMENTS.

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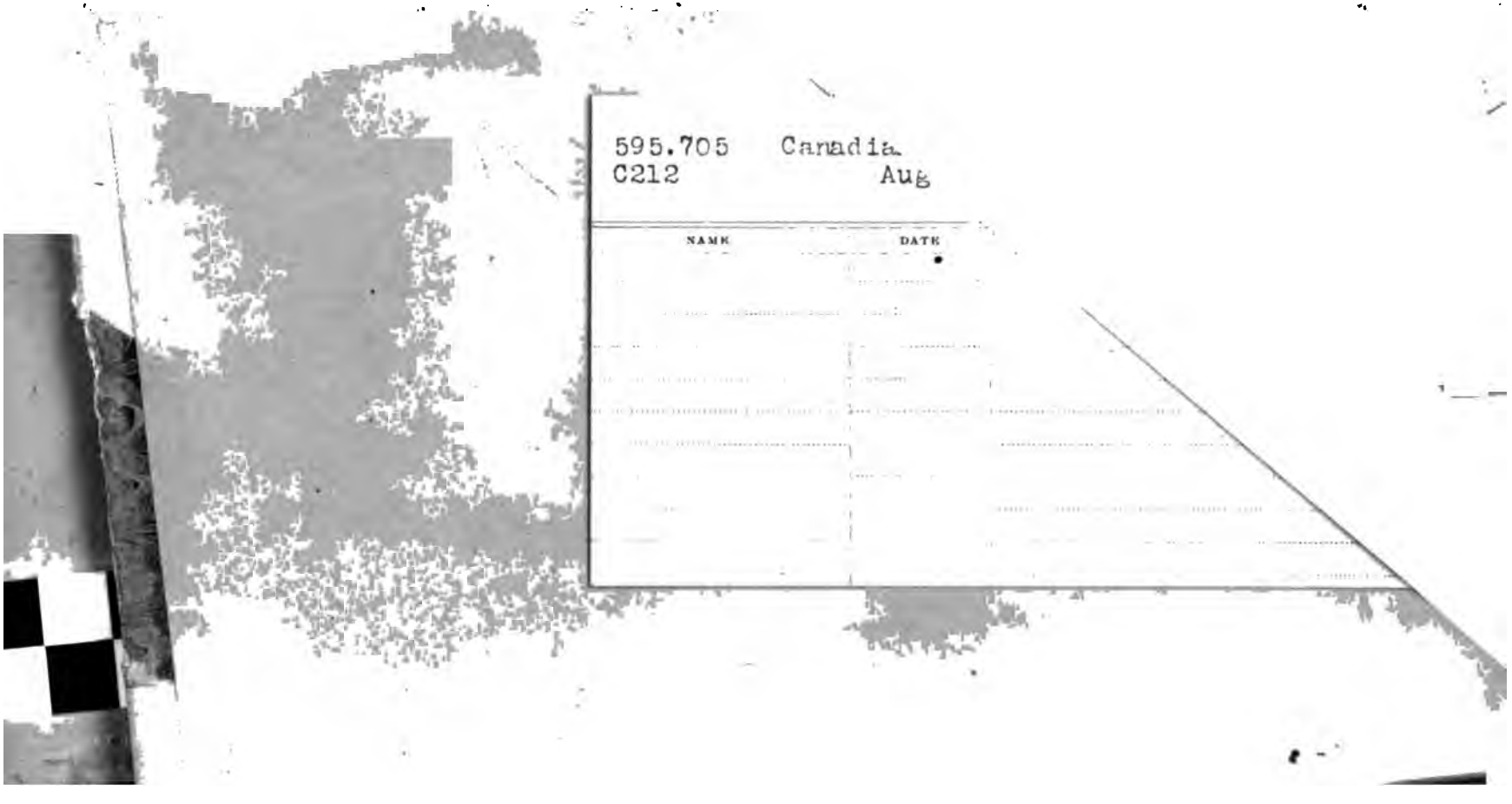
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